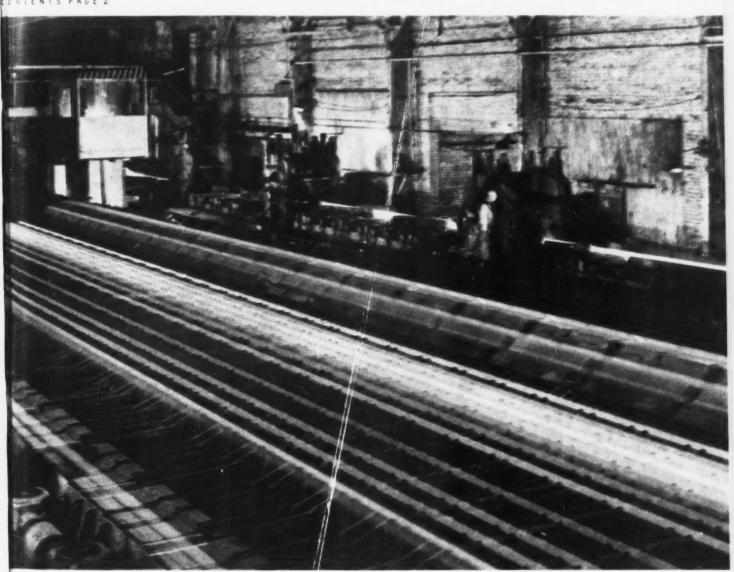
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NTENTS PAGE 2

November 13, 1952



Complete Rolling Mill Installations

SLABBING MILLS UNIVERSAL MILLS PLATE MILLS HOT STRIP MILLS COLD STRIP MILLS TEMPER MILLS

Mills complete with Auxiliary Equipment * * *

CONTINENTAL CHIPPER ROLL LATHES SPECIAL MACHINERY

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ROLLS iron, alloy iron and -teel rolls for all types of rolling mills

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CONTINENTAL Foundry & Machine Company





WORM GEARING—universal in its application—affards advantages for almost every younges for almost every younges for almost every younges for almost every your power transmission lob. Select power transmission meet your warm-gear units to meet your warm-gear line of Cleveland the complete Speed Reducers. Horm Gear Speed Reducers. For detailed information, diagrams and rating tables on grams and rating tables and standard small Clevelands standard small clevelands and available, write for our Bulletin 114. WORM GEARING—universal in its application—affords ad-Photo by courtesy of Con-tinental Foundry & Machine Company.

SLAB shears, working round the clock today, must have dependable drives. That's the reason so many of them—a dependable drives. That's the reason and cause shown a shear and cause shown the Continental downers. as with the Continental downcut shear and gauge shown

In the production and fabrication of steel, Cleveland worm Gearing Operate a grown Gear Speed Reducers and Worm Gearing Operate a In the production and fabrication of steel, Cleveland Worm Gearing operate a Worm Gear Speed Reducers and Worm dumpers and ore wide variety of equipment—from car dumpers and ore here—are equipped with Clevelands. Worm Gear Speed Reducers and Worm Gearing operate a ore wide variety of equipment—from car dumpers and ore wide variety through the mills to hear treat furnace. wide variety of equipment—from car dumpers and ore bridges right through the mills to heat-treat surherese bridges right through to make the fact wherever finishing presses and loading out crapes. bridges right through the mills to heat-treat furnaces, wherever finishing presses and loading-out cranes. In fact, wherever finishing presses and loading-out cranes. trouble-free right-any industry needs a powerful. finishing presses and loading out cranes. In fact, wherever right are industry needs a powerful, quiet, trouble-free any industry needs a powerful, a Cleveland at work. any industry needs a powerful, quiet, trouble-free ri angle drive, you're likely to find a Cleveland at work.

Wherever Clevelands serve—and you'll find tens of more.

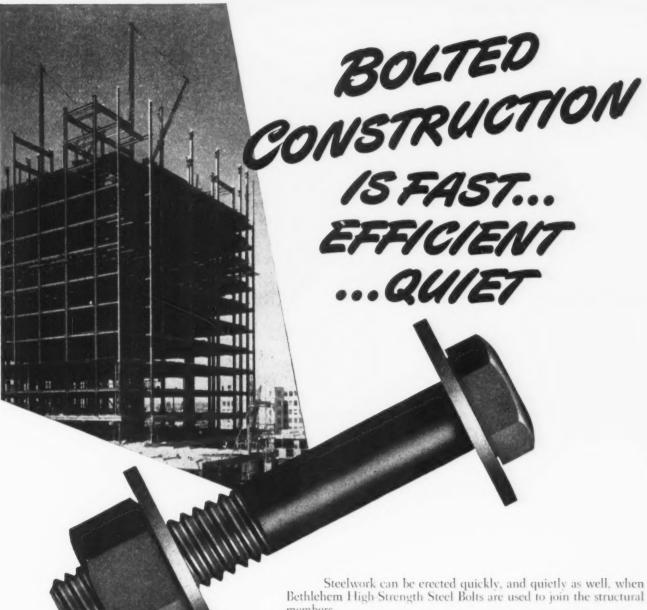
wherever Clevelands serve—and you'll find tens of more. Wherever Clevelands serve—and you'll find tens of thow sands of them on the job—many for 30 years and more—sands of them on the job—many for 30 years and more—sengineers will rell you that Clevelands will do their work. sands of them on the job—many for 30 years and more—sengineers will tell you that Clevelands will do their works under heavy loads, continuously or intermittently no matter under heavy loads. engineers will tell you that Clevelands will do their work under heavy loads, continuously or intermittently, no matter how severe the conditions, with a minimum of attention. under heavy loads, continuously or intermittently, no matter how severe the conditions, with a minimum of attention. In or near your city, there's a Cleveland engineer ready to erve you. He will be plad to discuss your name. In or near your city, there's a Cleveland engineer ready to serve you. He will be glad to discuss your power to meet you mission problems and suggest proper drives to meet you serve you. He will be glad to discuss your power trans-mission problems and suggest proper drives to meet your particular needs. The Cleveland Worm and Gear Co. 3252 mission problems and suggest proper drives to meet your particular needs. The Cleveland 4. Ohio.

East 80th Street, Cleveland 4.

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phiate: The Parval Corporation, Centralized Systems o Lubrication, In Canada: Peacock Brothers Limited.





New Booklet Gives Data on High-Strength Bolting

We have a new 8-page booklet, "High-Strength Bolting for Structural Joints." It's chock-full of data on structural bolting, and includes the information that needs to be supplied in ordering high-strength bolts. For your copy, write to us at Bethlehem, Pa.



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Bethlehem supplies every type of Fastener

the Iron Age - DIGEST

Vol. 170, No. 20 November 13, 1952

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THE IRON AGE, published every Thursday by the CHILTON CO. (INC.). Chestnut & 56th Sts., Philadelphia 39. Pa. Entered as second class matter, Nov. S. 1932, at the Post Office at Philadelphia under the act of March 2, 1878, \$8 yearly in United States, its territories and Canada; other Western Hemisphere Countries, \$15, other Foreign Countries, \$25 per year. Single copies, 35c. Annual Review and Metal Industry Facts Issue, \$2.60. Cables: "Ironage." N. T

NEWS DEVELOPMENTS

SOUND LABOR RELATIONS ON TWO FRONTS-P. 91, 92

The elections have swept away an Administration hostile to industry. Management now seeks only a square shake from the new regime. Don't expect labor to crawl away defeated. It will try to show its strength. Phil Murray's death came at a time when the old warrior planned a new phase of industrial relations.

SUBTERRANEAN SAFETY FOR STEEL RECORDS-P. 94

Exact location of a worked-out coal mine, Mine X, is a secret. It has good reason to be for it will store vital records of U. S. Steel Corp. and protect them against atomic attack. This "vault" is 200 ft underground and records will be safe even from a direct hit. The mine can be reached by two portals.

SUGGESTION BOX PAYS OFF IN MILLIONS-P. 95

Although the suggestion box has been the brunt of many jokes. It is saving management millions of dollars and helping out the worker's pocketbook. Two successful plans are at work in GM and Ford. They bring about production savings, safety, better working conditions, and improved labor relations.

INDUSTRY EXPANDING FASTEST IN THE SOUTH-P. 97

The rate of industrial expansion is faster in the South than in any other area. Expansion there is even more rapid now than during the war years. Fine ports, manpower, materials, and markets are contributing factors. Health and living standards soaring, too. Gulf Coast seen reaping richest reward.

HIGHER REVENUES HELP RAILROAD EARNINGS-P. 102

Increased revenues, largely from rate rises, and lower operating costs have improved the financial picture of Class I railroads. Net income through September '52 was estimated at \$502 million against \$391 million for the first 9 months last year. This represents an increased return on investment of 4.25 pct.

CANADA LEAVES DEFENSE THROTTLE OPEN-P. 11

Spending for Canadian defense program expected to match this year's \$2 billion. Allocation shift from plant construction to materials production anticipated. Cutback of foreign spending predicted. Consumer buying slips. Appliances suffer the most as inventories mount. Production may be reduced.

of the WEEK in metalworking

ENGINEERING & PRODUCTION

MARKETS AND PRICES

METAL CLEANER EFFECTIVENESS STUDIED—P. 151
Cleaners used in metal finishing operations are growing in complexity and number. A fatty acid soil, tagged with radio-active tracers, was used in tests. Radioactivity was measured with a Geiger counter before and after cleaning. The method, still a laboratory tool, is versatile, sensitive.

OUTLOOK FOR STAINLESS GLITTERS BRIGHTLY—P. 93
Stainless steel producers are happy with business now and prospects later. Order books are filled for the fourth quarter and shaping up well for next year. Producers see an ever-expanding market. One large potential market is in curtain wall building construction. Old standby markets are expanding.

AUTOMATIC UNIT DROP FORGES IN MID-AIR—P. 155
The automated factory moves a step closer with disclosure of a new automatic impact forging machine. Gone is the jarring crash of the forging hammer. This unit is vibration free. It holds stock in mid-air, strikes it horizontally from opposite directions at remarkably high speed.

BETTER SUPPLIES EASE FERROALLOY MARKET—P. 98
Ferroalloy salesmen are now beginning to look for customers as supplies become at least adequate for most items. Demand stays high on all. Columbium and tantalum are easing, but low carbon ferrochrome and low carbon ferromanganese are still on the tight side. Tungsten powder has come off the rationing list.

PORCELAIN ENAMELS SAVE INDUSTRY MONEY—P. 160
New porcelain enamels are continually being developed to
meet unusual industrial requirements. Their high resistance to
acids, alkalis, water, weather, heat and thermal shock can
reduce production costs substantially. In one case more than
2 million lb of black steel pipe were saved in 18 months.

REFRACTORY MARKET HAS 'FEEL' OF STRENGTH—P. 99
Some refractory producers have the fourth quarter jitters over
a somewhat depressed market. But many are optimistic over
sales in the future. They feel expanded steel output will buoy
up their market. What handicaps sales today are two purchasing sprees resulting in generally high consumer inventories.

ELECTROLYTIC GRINDING OF CARBIDES TESTED—P. 162
Diamond wheel grinding assisted by electrolysis offers promise
as a commercial method for sharpening single-point carbide
tools. Diamond consumption is only a fraction of that required in conventional grinding. There is some evidence of
electrochemical erosion of the tool.

FAT BACKLOG BOOSTS SPECIAL TOOL MARKET—P. 123
Special equipment builders optimistic about future market conditions. Some firms booked into middle of 1954. Manufacturers expected to make greater use of special tools, particularly appliance makers. Defense Production Authority raises machine tool expansion goals by \$6 million for 1953.

TITANIUM CASE HARDENED BY NITRIDING—P. 166
For greater utility titanium will have to be surface hardened.
Research on nitriding is being sponsored by Ordnance Corps.
Hardness gradients have been established for titanium and titanium alloys under varying conditions. Depth of case runs to 0.003 in. max. Highest hardness: Vickers 1098.

CONVERSION IS BOOKED INTO 2ND QUARTER—P. 195
Strike losses, inventory rebuilding, and amazing consumer appetites for steel are extending the life of conversion business.
Some commitments have been made into the second quarter.
The market would likely be even stronger were it not for the fact that fidle rolling space on mills is getting harder to find.

NEXT WEEK—JET TURBINE WHEELS USE 16-25-6 ALLOY Jet engines offer a wider field for application of 16-25-6 chrome-nickel-moly steel alloy developed during World War II. Now, reliable long time test data are available for the design engineer. Results of extended 10,000 hr creep tests made under varying heat treatments are described.

LEAD, ZINC MARKETS SHOWING FIRMER TREND—P. 198
Feeling in lead and zinc is definitely stronger. Signs point to
further price hikes in both. Buyers actually lined up to get
lead last week and more zinc is going at flat-price base.
Aluminum producers ask deferment of stockpiling and removal
of stockpile metal to fill in for power cuts.

November 13, 1952

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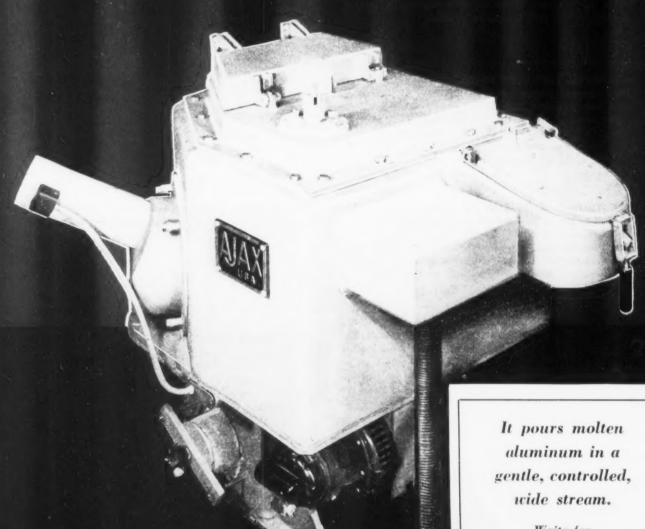
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V AGE

AJAXOMATIC



AN AUTOMATIC POURING UNIT FOR THE PRODUCTION OF ALUMINUM DIE CASTINGS

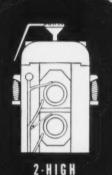


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AJAX ENGINEERING CORPORATION

TRENTON, N. J.

MACRGOIL ROLL NECK BEARINGS



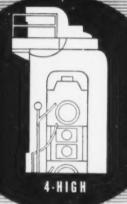
Aluminum Alloy bushings have been tested in MORGOIL Bearings

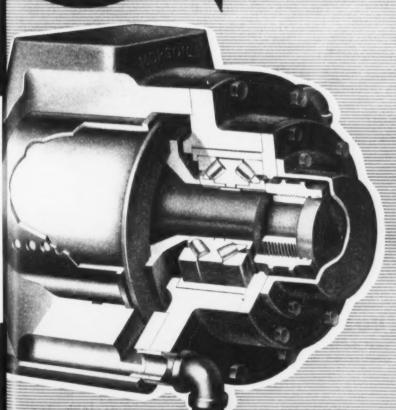
on all types of 2-high and 4-high mills, in the plants of many of

our customers and have definitely proven their superiority under

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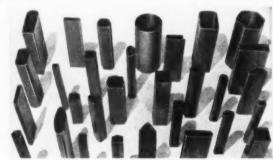
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Armco Welded Steel Tubing comes in a variety of made-to-order shapes in Hot-Rolled or Cold-Rolled

Steel; in Aluminized (an aluminum-coated steel) and in Zincgrip (a specially zinc-coated steel). Our Tubing Specialists will help you select the *right kind* of tubing for your products. Write for further information.



These are some of the standard and special shapes of Armco Welded Steel Tubing. With either standard or special shapes, you can reduce fabrication time and costs, give your products a more substantial look.

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Society of iness Magazine Editors





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Editorial

the Iron Age

FOUNDED 1855

A Businessman's Creed

Y candidate is to become President of my country. At long last I will have a man whom I can look up to, respect and honor. My hopes have been raised, my responsibilities deepened.

Everything I do, say or think will be watched. I must follow General Eisenhower's leadership of integrity, honesty and fearlessness. If I falter I do injustice to my country, to him and to my company.

I must not gloat secretly or act smug about my candidate's victory. I must remember that it was also a victory for the housewife, the laborer, the businessman and the public.

I must work hard for those things which brought the change in the nation's highest office. Fairness must be my watchword; change, when needed, my goal; and open-mindedness my weapon. Wherever I may be for the next 4 years I must remember that I am on trial, that my opponents are looking for an opportunity to point with scorn.

Because of this I pledge myself to greater participation in domestic affairs and greater interest in world events. I will make it plain that I have no thought of union busting: I know unions are here to stay. I know this world is different than it was 20 years ago and will govern myself accordingly.

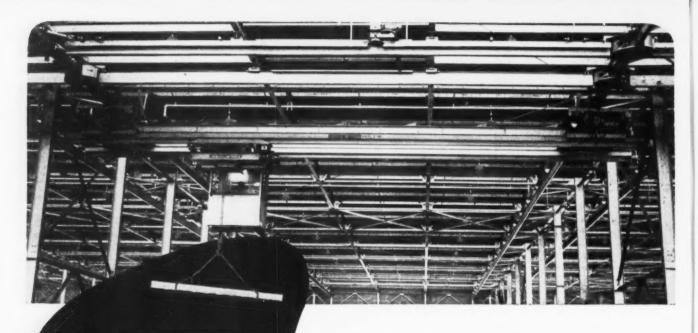
I will strive hard to explain myself and my company to whoever will listen. I will redouble my efforts to make my actions and those of my company an open book. I will defend to my utmost principles which I think are just and honorable.

When among my own group I will speak up when anyone violates my creed. I will not let his views be assumed to be mine by remaining silent. Only in this way can I help business generally and prove to others that we act as we preach and that we can and should be trusted.

I will refrain from becoming a tool of any pressure group whose purpose is contrary to honesty, integrity and fairness. But I will speak up strongly on my own when distortion of facts is practised by others. Only in that way can I live with my convictions, my conscience.

I will fight communism at home and abroad with everything I can command: I believe it to be a strong, sinister and articulate enemy of freedom. I will work for a better understanding between labor and management, between industry and the public. I will live up to my creed to the best of my ability.

Tom Campleee



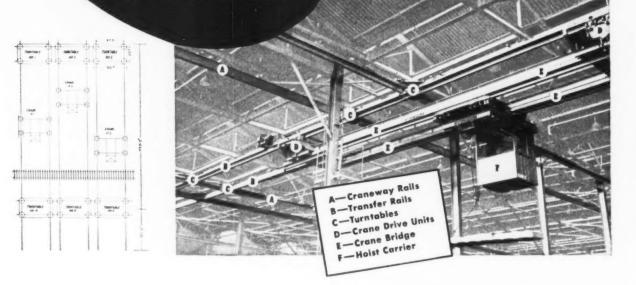
A CRANE that TURNS the

Imagine a crane that shifts from its craneway to another via 90° turntable—then shifts again at 90° to travel another craneway. It's like driving a car to the middle of an intersection, then instead of just the front wheels turning, all wheels turn at a right angle and the car travels sideways down the side street.

This crane offers fast hoist hook service throughout maximum areas without load transfer from original pick-up.

An American MonoRail engineer will gladly tell you now about its application.

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Dear Editor:

Letters from readers

What Is A Democracy?

Sir

I have read your good editorials off and on for some years. This refers to "On Bread Alone?" of Oct. 2 and "The Younger Generation" of Sept. 18 with the spirit of which I am in complete accord. I would, however, like to discuss with you the sentence in the fourth paragraph of the first which says, "We are not doing such a good job of protecting democracy from ideas that sound good but are phony," and a sentence in the last paragraph of the second which says, "A rebirth in democratic and ethical ideals by all adults is a crying need."

Democracy itself is an idea that sounds good but is phony. It is in fact one of the terms which has been used for 20 years to mislead our people. During that time, or perhaps a little longer, its definition has been changed to Madison's definition of "republic" and during the same period the party calling itself "Democratic" finally departed from Jefferson's Republican ways and now stands for their antithesis.

Our government is by constitution a representative republic, not a democracy as politicians of the present majority party have been telling us at least since Woodrow Wilson. The term is being used to sanctify in our time majority rule which, in no democratic country, has even been anything more than tyranny of the majority, that majority a captive of demagogues. Do you not believe our current majority a captive of demagogues?

A democratic government is a despotism of the majority in which the individual or a minority has not a single right, God-given or otherwise, which cannot be taken away by the majority's will—that will so remotely echoed perhaps as to be merely the dictation of a bureaucrat. Do you not believe this a keynote objective of current federal government?

Houston M. H. PARKS

Stainless Props

Sir:

AGE

On p. 83 of your Sept. 11 issue you made reference to the fact that the Navy expects to test stainless steel propellers on destroyers on the assumption that greater strength of stainless will permit the use of thinner blades and that this is expected to reduce cavitation.

I passed this information on, through our Information Service, and

have received the comment from our Admiralty Liaison Officer to the effect that the degree and thinness of the back edge of the blades has nothing to do with cavitation. It would be the shape of the blade which had an effect on cavitation. Since a stainless propeller would presumably have to be a casting, it would be enormously expensive compared to present materials used for blades.

An attempt was made some years ago to use the stainless propeller in the British Navy but so fer as I am aware there were no further developments.

R. SEWELL Information Officer United Steel Companies Ltd. Rotherham, England

A. F. TYRALA

Electrical Steels

Sir

Do any of the editions of THE IRON AGE contain articles on the history and development of electrical steels?

Elkins Park, Pa.

We are planning to publish a comprehensive article on this subject sometime in December.—Ed.

Thank You

Sir:

This is to ask your kind permission to reprint in "Rocks and Minerals Magazine" a short article which appeared in your Oct. 23 issue. The article concerned the GSA beryl buying program proposed by Jess Larson.

It is believed that such information could be valuable to mineralogists and miners—readers of our magazine. If reprinted, I feel that it will prove important to certain readers who are literally sitting on top of potential ore bodies in such states as Texas, Maine, New Hampshire and others.

IRON AGE never fails to print articles of great interest to me. The recent effort by members of Johns Hopkins on the roll-slip of laboratory-made crystals of metals was of great importance. It is felt, too, that such study will be very important to the making of special weldments and other specialized branches of the metals industry.

IRON AGE is distributed to various offices in our plant at Bethlehem Steel Co. in Pottstown, Pa. Some of us get quite a bang out of the forthright editorials in each issue of Iron Age—some of them are masterpieces.

C. A. THOMAS Rocks and Mineral Magazine Peekskill, N. Y.



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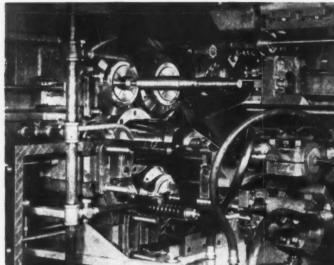
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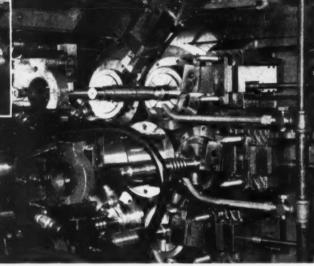
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November 13, 1952

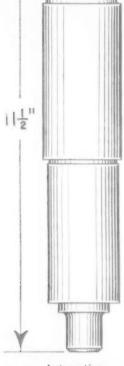


Tooling Area 31/2-SIX Front Side Rear Side

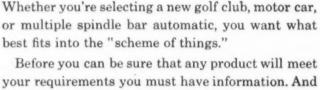


A very good reason why CONOMATICS handle a wider variety of machining operations per single chucking is their greater number of tooling positions.

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Automotive Transmission Shaft



your requirements you must have information. And you can judge only by that at hand or available. Complete information lets you decide what's important to you. That's as it should be.

There's always more information to be had about the product that has more to offer. It's that way about CONOMATICS. And you can always have complete information. If you will write, wire, or phone, you can have it now.

A Comparison of ALL Automatics is in favor of Cone



Conomatic CONE AUTOMATIC MACHINE COMPANY, INC. WINDSOR, VT., U.S.A.

Fatigue Cracks

by William M. Coffey

More Doctors Smoke Camels

Many people have wondered, rightly enough, why THE IRON AGE with its country-wide teletypeears close to the hinterlands, with a 35-man roving team of editorial experts and its full-time staffs ever on the alert in Washington, San Francisco, Philadelphia, Chicago and Urdu-didn't enter the election poll business like everyone

Naturally we conducted a poll, but because November 4th was a holiday we were unable to announce our findings until now. We knew, for instance, very early in the game that the Socialist, the American Labor and the Liberal candidates didn't stand a chance unless strong elements of the WCTU and the downstate Independent Clamdiggers joined forces -and even if they did the gap could definitely widen by as much as 5.634%.

We were convinced of this early on election day when Florida's Brown farm precinct voted 4 for Stevenson and 4 for Eisenhower. From there it was merely a matter of feeding these figures into our Umnut Calculator to establish the trend that a large percentage of the nation's voters were.

The tip-off on this came when Stevenson rushed to the Illinois State Prison and let them all out to vote. Latest results, of course, have substantiated our coefficients , and now, perhaps, Ike will kick that fellow McCarthy out of the State Department for fooling around with all those communists.

Puzzle Number One

How did Nixon know Eisenhower had won three hours before Eisenhower knew Nixon had won-and why did we take the trouble to vote on November 4th when the G. I.'s in Korea already knew the results on November 3rd? Huh, wassamatter? Of course, on the other hand a 2.4% shift in the Labor vote of the Tidelands could very well break a large segment of Farm write-ins-a factor always to be considered.

Wet and Thirty

E

Something as eagerly awaited, nearly, as your f. f. j.'s famous Annual Yearbook issue due in January, is the Old Farmer's Almanack. The 1953 edition is out and as usual it is chuck full of unusual items "Fitted for Boston, and the New England States, with Special Corrections and Calculations to Answer for All the United States." One treasure we particularly like is this Old Maine Weather Verse:

Dirty days has September, April, June and November; From January up to May, The rain it raineth every day;

All the rest have thirty-one. Without a blessed gleam of sun:

And if any of them had two and thirty

They'd be just as wet and twice as dirty.

Also a ten degree dip in temperature could most certainly sway Montana sheep herders into the Baruch Bloc. Watch this . . .

Japs to the Right of Us . . .

. . and speaking of the election, among the Collier-Brothers type debris we removed from the desk of Charlie (ex-Fatigue Cracks) Post in addition to a white tie, a pair of used socks, reams of 1908 correspondence and a French magazine (well hidden) called "Rire," we found a small black memo book for the year 1941. Typical is this entry for December 7th:

> 550,000 Japs 800,000 Japs 1,300,000 Japs

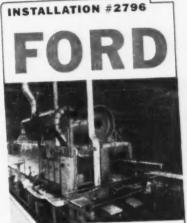
Not a word of explanation. Just 550,000 Japs, 800,000 Japs and 1,-300,000 Japs. Most interesting too, is an insight into C. Post's budget of that period. A day's expense: reads like this ver batim: Donut .05, Boot Heels 50¢, Paint 88¢, Grog. \$4.09. Hamburger .52, Bell Boy 10c. An interesting day.

. and in case you forget, Charlie, Jane's birthday is March 16, H. G. G.'s April 21, B. S. R.'s July 27, L. B. K.'s October 7, B. S. K.'s October 9, E. P.'s October 24 and J. G. H.'s October 27.

Final Summary . . .

. . . of THE IRON AGE election poll: EISENHOWER CANNOT WIN UNLESS HE GETS 266 ELECTORAL VOTES. This could be subject to change, however, and we must allow a straw-in-the-wind safety factor of 100%. Otherwise you can bet on it.





Metalwash Conveyor Washer, one of two in series, performing final wash before engine assembly at FORD MOTOR COMPANY ENGINE PLANT, CLEVELAND, OHIO.

METALWASH ENGINEERING EXPERIENCE IS YOUR ASSURANCE OF LASTING PERFORMANCE

For further information about Metalwash Industrial Cleaning Machinery, please write for free illus-



trated catalog describing our complete line of standard and custom engineered machinery for washing, pickling, drying.

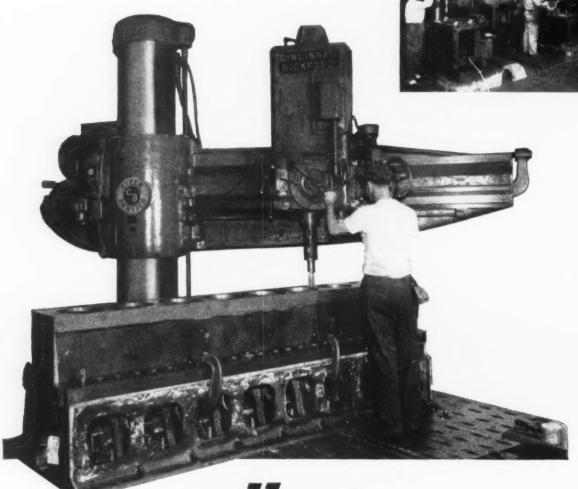


MACHINERY CORPORATION

920 NORTH AVE. . ELIZABETH 4, N. J.

REPRESENTATIVES IN PRINCIPAL CITIES.

This battery of Cincinnati BickfordSuperServiceRadial Drills is drilling, tapping and reaming smaller parts.



"excellent in all respects"...

The ease of handling, the performance, accuracy and speed of the 7' arm, 19" diameter column Cincinnati Bickford Super Service Radial Drills "rated excellent in all respects."

The job involved drilling, tapping, reaming of 43 holes in a large diesel cylinder block.

A battery of smaller Cincinnati Bickford Super Service Radial Drills is also giving "excellent" performance.

Write for descriptive circular of these fine machines.





RADIAL AND UPRIGHT DRILLING MACHINES

THE CINCINNATI BICKFORD TOOL CO.

Cincinnati 9, Ohio, U.S.A.

Conventions & Meetings

Nov. 10-13—National Electrical Manufacturers Assn., semi-annual meeting, Haddon Hall Hotel, Atlantic City, N. J. Association headquarters are at 155 E. 44th St., New York,

Nov. 10-14—Wire Assn., annual convention, Cleveland. Association headquarters are at 300 Main St., Stamford, Conn.

Nov. 13-14—National Constructors Assn., Labor Committee and Executive Committee, Hotel Roosevelt, New Orleans. Association headquarters are at 50 E. 41st St., New Pork.

Nov. 19—American Mining Congress, Coal Division Conference, Pittsburgh. Society headquarters are at 1200 18th St., Washington.

Nov. 19-21—American Management Assn., Finance Conference, Hotel Roosevelt. New York, Association headquarters are at 330 W. 42nd St., New York.

Nov. 20-21—American Society for Quality Control, mid-West Conference, Claypool Hotel, Indianapolis,

Nov. 21 — Malleable Founders Society, Western Section meeting, The Drake, Chicago. Society headquarters are at Union Commerce Bldg., Cleveland.

Nov. 28-30—Grinding Wheel Institute, annual meeting, Hotel Statler, Buffalo, Association headquarters, P. O. Box 64, Greendale, Mass.

Nov. 30-Dec. 5—American Society of Mechanical Engineers, annual meeting, Statler Hotel, New York. Society head-quarters are at 29 W. 39th St., New York.

Dec. 2—National Warm Air Register Manufacturers Institute, annual meeting, Cincinnati. Institute headquarters are at 5 E. Long St., Columbus, Ohio.

Dec. 2—Spring Manufacturers Assn., annual meeting, Biltmore Hotel, New York. Association headquarters are at 249 Main St., Bristol, Conn.

Dec. 2—Society of Automotive Engineers, Inc., Hotel Statler, New York, Society headquarters are at 29 W. 39th St., New York

Dec. 3-4—National Warm Air Heating & Air Conditioning Assn., annual convention, Sheraton-Gibson Hotel, Cincinnati. Association headquarters are at 145 Public Square, Cleveland.

Dec. 3-5—Society for Experimental Stress Analysis, fall meeting, Hotel McAlpin, New York. Society headquarters are at Central Square Station, Cambridge, Mass.

Dec. 3-5—National Assn. of Manufacturers, Congress of American Industry, Waldorf-Astoria, New York. Association headquarters are at 14 W. 49th St., New York.

Dec. 4-5—American Institute of Mining & Metallurgical Engineers, Electric Furnace Steel Committee, Iron & Steel Div., annual conference, Hotel William Penn, Pittsburgh. Institute headquarters are at 29 W. 39th St., New York.

Dec. 7-10—American Institute of Chemical Engineers, annual meeting, Hotel Cleveland, Cleveland, Institute head-quarters are at 120 E. 41st St., New York

PACKAGED carbon dioxide FIRE EXTINGUISHING SYSTEM

inexpensive ... simple ... sure!

Do you want maximum fire-fighting power at minimum cost? Then you want the new *Kidde* Standard Pak. It's an inexpensive ready-made system you can build in for protection against tough fires in normal flammable liquid hazards.

Anyone who can cut pipe can set up this pre-engineered fire extinguishing "package." Choose from six sizes for volumes up to 6,000 cubic feet.

Every kit contains *Kidde* rate-of-temperature-rise heat detectors, *Kidde* Multijet nozzles, and automatic discharge heads. Pipe and fittings are optional, as are pressure trips and switches, remote controls, sirens, gongs. pre-engineered

any pipefitter can install it



merely measure the size of the room



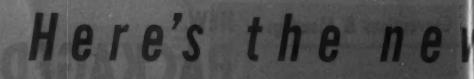
Send today for further details on The New Kidde Packaged Fire Extinguishing System.



Walter Kidde & Company, Inc. 1149 Main Street, Belleville 9, N. J.

Walter Kidde & Company of Canada, Ltd., Montreal, P.Q.

GE



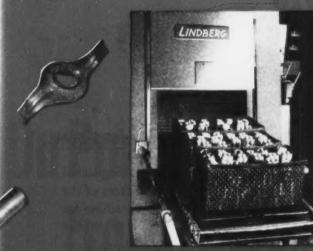
LINDBERG CARBONITRIDING FURNACE

It's many-furnaces-in-one! • It's designed not only for carbonitriding . . but also for hardening, carburizing, annualing and carbon susteration! • It's a self-contained unit! • It's easy to maintain!

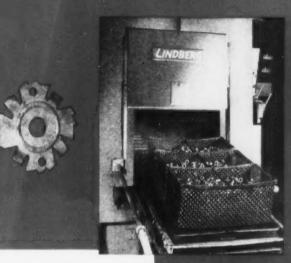
Change tubes like the blades in your razor! It's easy to change the new thin-wall tubes—just lift 'em out and hang new ones in place... all in a matter of minutes.

LINDBERG

The greatest advance in industrial furnace design and construction since Lindberg introduced the Cyclone forced convection tempering furnace back in 1935!



A 320 lb. load of CR5 sleeves. Carbonitrided .010 to .015". 90 minutes in heating chamber. Temperature 1600" F



Yes, you must see the new Lindberg Carbonitriding Furnace. It's many furnaces in one . . . it's easy to maintain . . . it's a self-contained unit,

Check these important construction features . . . features that will improve production quality and volume, and reduce production costs.

Many furnaces in one . . . Furnace atmosphere is provided by the Lindberg "Hyen" endothermic atmosphere generator that is easily adjustable to supply different atmospheres not only for carbonitriding, but also for carburizing, carbon restoration, bright hardening or annealing and normalizing. For annealing and normalizing the heated charge cools in the same chamber used for purging.

Easy to maintain . . . Instead of old style, heavy, unwieldly, horizontal radiant tubes . . . new gas-fired, lightweight tubes (only 29 pounds) are used. They're simple to change . . . turn off the gas . . .

get on top the furnace...lift out the old tube...hang a new one in its place... and the thin, rolled metal tubes actually last longer!

Quench tank pit unnecessary . . .

Your Lindberg Carbonitriding Furnace is self-contained, including a built-in pitless quench tank . . . thus you avoid costly excavation and piping. But more important, this built-in quench tank minimizes distortion . . . quenching takes place within the furnace structure, by means of a vertically operated elevator. Heated charges are never exposed to the air . . . as is the case when work is transferred from the heating chamber to a separate quench tank. Uniform case depth is assured because each charge automatically remains at heat the same length of time.

Purge chamber . . . A specially designed chamber, built immediately above the quench tank and in front of the heating chamber, receives work load for purging prior to heating.

.005". 60 minutes in heating chamber, Temperature, 1600, F.



A 120 lb. load of CRS screws. Carbonitrided .005 to .008". 45 minutes total

For full details ask for Bulletin 241

Lindhara Engineering Company

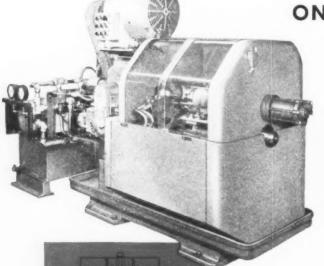
2445 W. Hubbard Street, Chicago, Illinois

LINDBERG FURNACES

AUTOMATICITY BACKS UP

HIGH VELOCITY TURNING

ON FAY AUTOMATICS



SIDE GEARS 18 Seconds Floor to Floor — 635 SFM

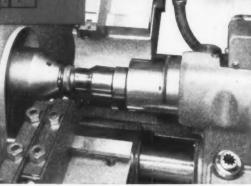
Two 8" Fays, with Automatic Sequential Control, machine all exterior surfaces of the blanks in two operations; one machine for each. The major diameter is 2-15/16" and floor to floor time is approximately 18 seconds in each operation.

Automatic Cycle - The machines are equipped with automatically operated splash guards and automatically air-operated tailstock rams for pressing the blank onto a splined arbor equipped with automatically operated ejector pins.

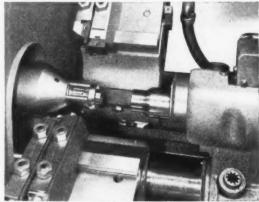
The operator places the blank on the end of the arbor, and pushes the cycle start button. Automatically, the guard closes, the tailstock ram presses the piece onto the arbor and then retracts. The carriage turns, the back arm faces, and at the end of the cuts, ejector pins push the piece onto the loading section of the arbor from which it is removed manually.

FIRST OPERATION:

Note intricate movements of the carriage, which turns the hub, back angle and major diameter. The back arm faces and forms.



Tailstock presses blank on arbor



Ejector pins release blank from arbor



Production management regularly relies upon the engineering services of Jones & Lamson for the latest information on methods, costs, tooling and performance. Why not consult us about YOUR turning, threading and inspection problems.

Machine Tool Craftsmen Since 1835



FAY LATHE DIVISION

JONES & LAMSON MACHINE CO., Springfield, Vt., U.S.A. Dept. 710



Du Pont "TRICLENE" D offers you trouble-free performance

Good, economical vapor degreasing requires a solvent that has been specifically designed for the job. That's why so many manufacturers specify Du Pont "Triclene" D Trichlorethylene. They know that this rugged solvent offers trouble-free performance in all kinds of degreasing operations.

Chemically inactive inhibitors in "Triclene" D help assure freedom from deposits and stains—even on copper bearing alloys and other sensitive metals. Uniform distribution of these inhibitors in the solvent is maintained at all times during the boiling-

condensing cycle. And because "Triclene" D is chemically stable, there's minimum formation of inorganic salts...maximum recovery of stabilizer from sludge.

"Triclene" D is neutral...stays that way through countless degreasing cycles. Stabilizers in its formulation prevent solvent breakdown. Other plus values of "Triclene" D include a narrow boiling range, high purity and low residue on evaporation... properties that make it the ideal solvent for removal of modern lubricants on industry's toughest degreasing jobs.



PERFECTED BY RESEARCH "Triclene" D meets exacting federal and military specifications, yet costs no more than other leading brands of degreasing solvents. It is available nationally in 55 gallon drums and tank cars. Distribution points in over 100 principal cities are ready to serve you promptly. And Du Pont technical men will be glad to work with you in keeping degreasing installations operating at peak efficiency.

VALUABLE INFORMATION on "Triclene" D is yours free in the 20-page booklet "Vapor Degreasing with Du Pont Non-Flammable Solvents." It shows you how and where "Triclene" D can save time and cut costs in metal cleaning. Send in the coupon below for your copy.

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150% Anniversary

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E. I. du Pont de Nemours & Co. (Inc.) Electrochemicals Dept., Wilmington 98, Delaware

Please send me detailed information on vapor degreasing with "Triclene" D, including your free 20-page booklet. I am interested in cleaning ______products.

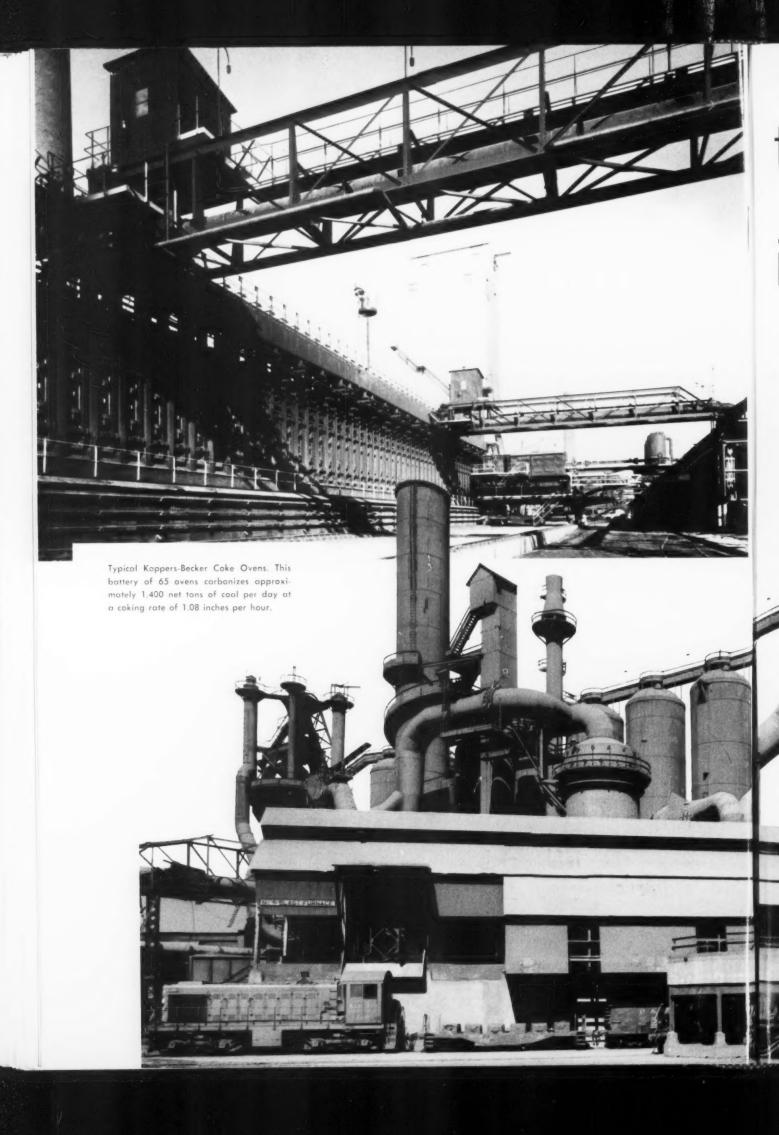
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Firm____

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November 13, 1952

17



the PLUS FACTOR

in Koppers Engineering Services

NY company, engaged in metallurgical construction, must have engineering skill. It is the common denominator that goes into every one of our construction assignments.

Included in Koppers Metallurgical Engineering and Construction Services is a value that is of intangible, but very real benefit to the company's customers. This value is based on more than fundamental engineering skills. Rather, it stems from all of the varied knowledge, techniques and background that have been acquired over the years by Koppers Engineers in handling the most exacting metallurgical construction projects.

Difficult to define or measure, this unseen value is in fact the Plus Factor of Koppers Engineering Services that makes for customer satisfaction. You are invited to consult with our Engineers and Management.

> For any kind of metallurgical construction YOU CAN COUNT ON KOPPERS



KOPPERS Engineering and
Construction Division

KOPPERS COMPANY, INC. PITTSBURGH 19, PA.

New Freyn-Design Blast Furnace. Soaring 225 feet skyward, this furnace has a hearth diameter of 25 feet and a capacity of 1,100 net tons of iron per day.

controlled atmosphere GAS FIRED FURNACES



at A. O. SMITH CORPORATION

GAS. THE MODERN FUEL INDUSTRY



Diagram of Gas-fired glass-coating furnaces at A. O. Smith Corporation, used to fire glass-lined water heaters and Harvestore sheets. Capacity of one furnace is 1,182 cu. ft. At left: Load enters furnace.

Gas-Firing for dependable glass-to-metal bonding is accomplished under controlled atmosphere conditions at A. O. Smith Corporation's plant in Kankakee, Illinois. Three furnaces like the one shown are utilized. Each furnace has two zones. First zone, at 1050° F. is for pre-heat, controlled oxidation, and the second controlled atmosphere zone fires at 1600° F. Each zone is fired by 16 Gas burners, eight to a side through heat resistant alloy "radiant" tubes. All Gas-firing is under precise automatic control, to get exact temperatures needed for processing.

Process Heating with GAS is used at A. O. Smith in a variety of ways, too,

- 1. Gas-fired immersion coils in liquid baths
- 2. Submerged Gas burners in pickle liquor tanks
- 3. Direct Gas-fired burners for heating zinc, hot-dipped, galvanized

Typical uses include spray washer baths to clean steel, Bonderizing process before painting, galvanizing process for cleaning, pickling and rinsing. The fuel savings with GAS paid for installed Gas Equipment the first year!

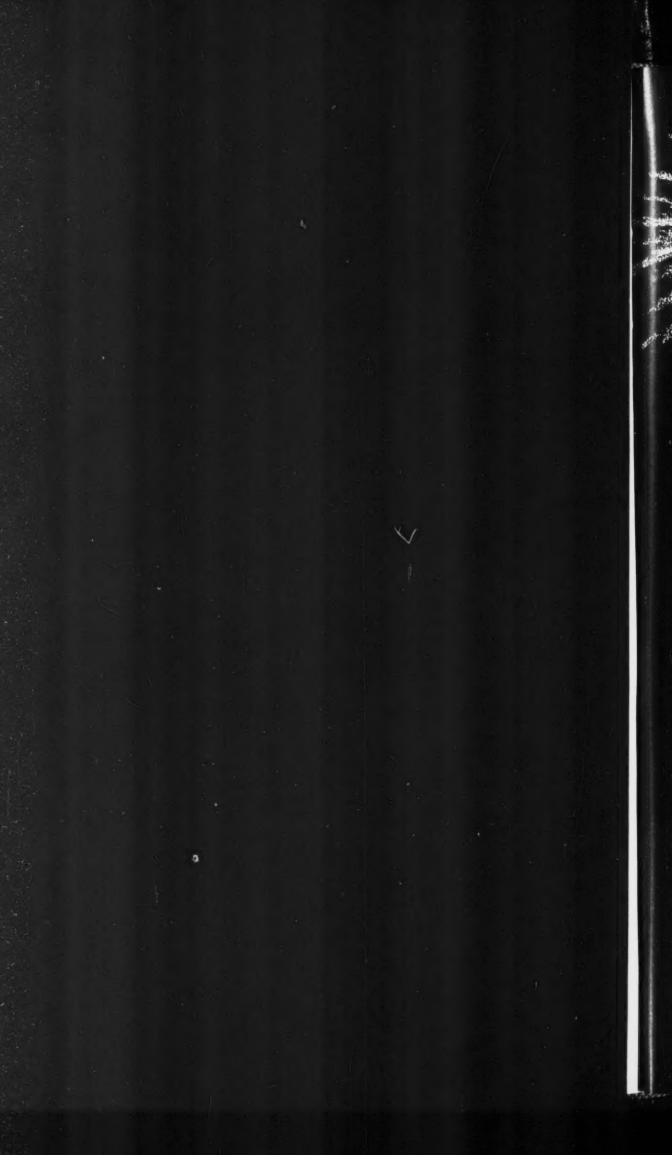


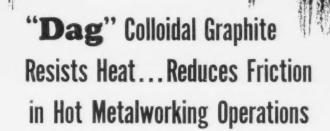
Whatever your production line problems, Modern Industrial Gas Equipment can be designed to integrate readily with your production techniques. Gas is the Modern Fuel for All Industry, because Gas is efficient, economical, versatile. Gas can be controlled automatically and precisely, to meet the most exacting processes. Get the facts today from your Gas Company Representative.

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CE





In deep piercing, casting, forging, stretch-forming and wire drawing operations, "dag" colloidal graphite dispersions assure a smooth product and reduce die wear . . . insure smooth surfaces and clean parting . . . minimize scaling and sticking . . . reduce tearing and rippling . . . and assure uniform wire diameters. This unusual lubricant reduces friction and withstands temperatures much in excess of those common to metalworking operations.

"Dag" colloidal graphite is electric furnace graphite that has been specially processed to subdivide it into particles of microscopic size. When "dag" colloidal graphite is applied to the friction surfaces of metal it leaves a lubricating film so thin that even the most sensitive gages cannot detect it. The film is many times more durable than an oil film. It provides the metal with a graphoid surface that has an extremely low coefficient of friction, that resists oxidation, and that will function at temperatures far above the burning point of oil.

The uses of "dag" colloidal graphite for all metalworking operations are explained in a recent bulletin available without obligation. Write today for Bulletin No. 426-13L.



Acheson Colloids Company,

Port Huron, Mich.

... also ACHESON COLLOIDS LIMITED, LONDON, ENGLAND

Units of Acheson Industries, Inc.

Is your present abrasive method



Only CARBO

"Carborundum" is a registered trademark which indicates manufacture by The Carborundum Company, Niagara Falls, New York

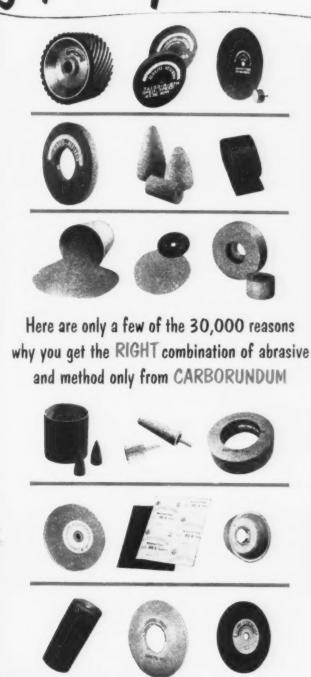
really good enough, today?

Chances are good that if you've been using the same method for a mere two years, there's now a better way. That's how thick and fast the new developments in abrasive techniques have come along. Every day someone, somewhere, is switching from one method to another, under the pressure of one hard economic fact: the need to cut costs.

Here lies the biggest advantage to the shop which has standardized on abrasives by CARBORUNDUM. You get counsel free from bias, for the CARBORUNDUM distributor or salesman represents the only producer of a complete branded abrasives line, famous for uniform high quality. Thus he can recommend on the basis of what's most profitable for you, not just what's most profitable for him. And he can keep you posted on all the newest practices of metalworking shops from coast to coast.

Make a mental run-down today of each

abrasive operation your shop performs, then call in the man from CARBORUNDUM for his experienced, practical, unbiased counsel. You'll find him listed in the yellow pages under "Abrasives."
Call him today—it's to your profit!



RUNDUM

offers ALL abrasive products...to give you the proper ONE



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Send us information about the products you wish to manufacture and the machinery you wish us to produce for you. Our design and engineering service is available to serve you. Ask for latest brochure listing our equipment and facilities.

SEMCO

SERVICE MACHINE COMPANY

150 Miller Street

Elizabeth 4, New Jersey

Customer Reports:

Buying Bearing Bronze in 105" Lengths Cuts Short-End Scrap Drastically

The National Broach & Machine Company, Detroit, scrapped 434" to 6" of bronze for every spindle and shaft bearing made from standard 13" stock. The bearings run 7" to 8¼"; therefore only one could be made from each standard bar.

By buying Asarcon 773 bronze bars in 105" lengths, the company is able to cut pieces in the exact size needed for its "RED RING" gear testing machine bearings. There is only one short end for an entire bar . . . scrap loss is at a minimum,

ASARCO Continuous-Cast Bronzes . . . cut in

the length you want . . . can reduce scrap losses for

you, too. In addition, the consistent dimensional uniformity of the stock means that you get a virtually finished product that requires less machining. Metallurgical

defects are non-existent. There are no hard and soft spots, no porosity, no dirt, dross or sand.

Why pay for metal that will only go to scrap? Specify ASARCON 773 bearing bronze and get the length you need.

216 sizes of ASARCON 773 (SAE 660) bronze are stocked in 105" lengths . . . tubular or solid round and from 12" to 5" diameter . . . at warehouses in principal cities across the country. Distributors will cut stock long or short to suit your specific requirements. Other alloy rods, tubes and shapes are available in any length up to 20'.

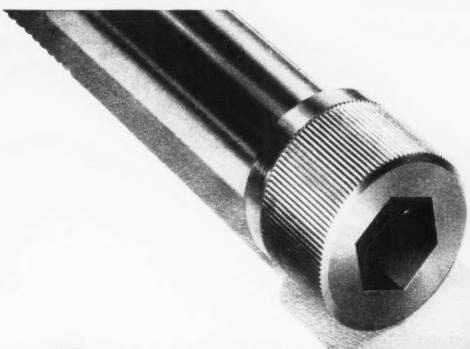


West Coast Sales Agent: KINGWELL BROS. LTD., 457 Minna Street, San Francisco, Calif.

American Smelting and Refining Company

OFFICES: Perth Amboy Plant, Barber, New Jersey





SAVE 2 WAYS with UNBRAKO SOCKET HEAD CAP SCREWS



TAP FEWER HOLES

It costs money to tap holes. You have to lay out, center punch, center drill, tap drill, body drill, counterbore, tap the hole, and insert the screw. The fewer holes you tap, the less the cost. Three UNBRAKO screws will do the same job as five ordinary cap screws.



2 USE SMALLER DIAMETER **FASTENERS**

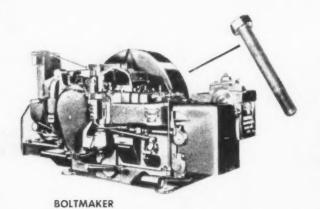
Since a 3/8" UNBRAKO Socket Head Cap Screw is as strong as an ordinary carbon steel screw of 1/2" diameter, you save in weight and cost by using UNBRAKO. And because smaller diameter screws require less space, they permit more compact designs.

When designing, it pays to save with UNBRAKO! Write for descriptive literature. STANDARD PRESSED STEEL Co., Jenkintown 17, Pennsylvania.

UNBRAKO SOCKET SCREW DIVISION



CAP SCREWS - SET SCREWS - SHOULDER SCREWS . DOWEL PINS . PRESSURE PLUGS

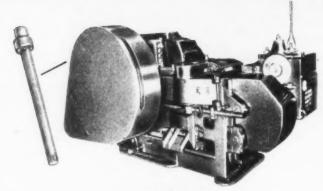


COLD NUT FORMER

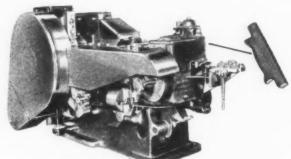
Our Job: HELPING YOU



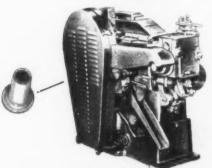
NAILMAKER



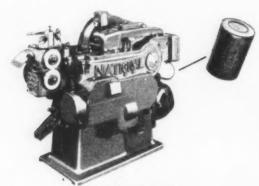
PROGRESSIVE HEADER



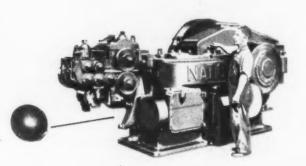
COLD HEADER



TUBULAR RIVET HEADER



ROLLER HEADER



BALL HEADER

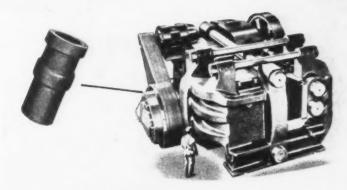
• Most people think of metal as an unyielding solid. To us it's fluid, even when cold. For 76 years our business has been the development of methods and machines which make metal flow by pressure into shapes required for the countless parts used in industry.

In peace and war, a growing share of the world's forgings, fasteners and other parts are being made on NATIONALbuilt machines.

For example, large automobile crankshafts are finish-forged on a MAXIPRES weighing 1,600,000 pounds . . . five-penny nails stream from a NAILMAKER all day long 13 a second . . . ball-point pen balls, so small it takes 111,000 to make a pound, are made automatically from coiled wire on the smallest Cold Header.

NATIONAL'S all-around experience covers the full range of forging—hot and cold, large and small, ferrous and nonferrous.

If you have a forging problem—hot or cold—or feel you might benefit by converting a certain part to a forging, why not have us take a look at it?



FORGING MACHINE

"FLOW" METAL!





THIS DOOR IS ALWAYS OPEN

Send us a print or sample of your job. Better yet, pay us a visit. No obligation.

NATIONAL MACHINERY COMPANY

DESIGNERS AND BUILDERS OF MODERN FORGING MACHINES-MAXIPRESSES-COLD HEADERS-AND BOLT, NUT, RIVET, AND WIRE NAIL MACHINERY

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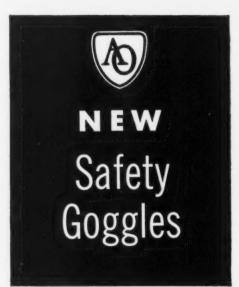
Chicago

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Now . . . 2 New

AO COVERGLAS GOGGLES

Fit Over Safety And Personal Glasses





- 1. New Cup Size and Shape
- 2. New Lens Size and Shape
- 3. New Side Shields
- 4. New Easy Lens Replacement

• Lens easily replaceable from rear (not front) by means of a spring clamp—no tools needed

#327

- Lightweight, brown plastic cups fit face snugly, won't conduct heat or electricity
- Light-tight side shields for welders (on No. 327 goggle) provide indirect ventilation
- · Bridge-High-grade leather. Instant adjustment
- AO worker-lab tests show much greater field of vision and increased comfort
- All-rubber headband, easily adjustable
 "326" Chippers Coverglas goggle supplied with regular Super Armorplate lenses. "327" Welders' Coverglas goggle supplied with regular Noviweld lenses and cover lenses.

AO's Industrial Vision Program Increases Production, Decreases Accidents. Write today forbooklet''Improved Industrial Vision'' to 1011 Vision Park, Southbridge, Mass.

AO's newest development in eye protection—Chippers' and Welders' Coverglas Goggles—can be worn over practically every pair of personal glasses (even the biggest frames) and most types of safety prescription goggles with and without side shield.

Wider vision, too, because the lenses are larger and scientifically designed to give up to 20% more vision. Yet, with all these features the goggles weigh but a fraction of an ounce more than ordinary Coverglas goggles . . . cost only slightly more.

These goggles are the newest . . . and two of the greatest . . . developments since the advent of safety goggles. Get all the facts about these two outstanding Coverglas goggles from your AO Safety Products Representative. He can supply you.



SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES



Here's another example where the fabulous Cri-Dan "D" threading machine licked a tough threading job in seconds that would have normally taken minutes.

This time the part was a Diesel Engine Stud, $2\frac{1}{2}$ " in diameter in which a 4-pitch thread $2\frac{1}{2}$ " long had to be cut in 4150 S.A.E. steel.

The well-known company* doing the job reports phenomenal results in accuracy as well as speed using the Cri-Dan "D" with a single carbide tipped tool.

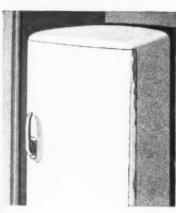
Whether you have an unusually tough threading problem where accuracy is at a premium, or a threading operation you'd like to speed up, by all means check with your Lees-Bradner representative and get the facts on the Cri-Dan "D".

*Name on Request















PAINT FAILURE

can wreck your products reputation !

... better use **BONDERITE** under the paint

Appearance counts heavily in the public's judgment of your product. Not only how it looks when new, but how it looks after years of service . . . Bonderite, under the paint of your metal products, can make the difference between a "thumbs up" and a "thumbs down" judgment,

Bonderite, Parker's corrosion resistant paint base, preserves the good looks of the nation's finest painted metal products. By creating a tight coating of nonmetallic phosphate integral with the metal, it gives paint a secure anchor, resists corrosion and prevents the spread of finish failure if the paint is accidentally scratched or broken.

Bonderite adds value out of all proportion to its cost,

Your painted metal product should have Bonderite-protection. Write today for full information.

FIRST

in the field/since

*Bonderite. Bonderluhe, Parco, Parco Lubrite - Reg. U.S. Pat. Off.

PARKER RUST PROOF COMPANY

2186 E. Milwaukee Ave., Detroit 11, Michigan

BONDERITE—corrosion resistant paint base

BONDERITE AND BONDERLUBE aids in cold forming of metals

PARCO COMPOUND

PARCO LUBRITE—wear resistant for friction surfaces

For grinding your steel castings rely on Norton ALUNDUM* wheels to REDUCE COSTS

Whether you use swing grinders, floor stands, disc grinders or portable grinders to rough-grind your steel castings, you'll find a Norton ALUNDUM wheel that fits any grinding job in your foundry. So, cut the costs of cleaning by specifying these long lasting, fast cutting wheels.

Your Norton Distributor and Abrasive Engineer will be glad to work directly with you, helping you select wheels to fit such variables as: the condition and type of the easting... the area of wheel contact... the amount of pressure applied and heat generated... the type of grinding machine used.

These practical grinding men will tell you which ALUNDUM abrasive to use for your cleaning room jobs and which of the several outstanding Norton bonds (BH, B5 and B7 resinoid for high-speed operation, and BE vitrified for slow speed) will do your jobs best. Meanwhile, get your copy of the authoritative, illustrated, 48-page Norton booklet, "Rough Grinding." Ask your nearby Norton Distributor for FORM 1405 or write us direct. NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities. Export: Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass.



Making better products to make other products better

Trade-Mark Reg U.S. Pat. Off. and Foreign Countries



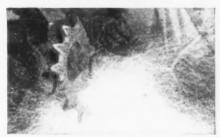
BE SURE OF FAST CUTTING ACTION . . . without sacrificing wheel life. Norton ALUNDUM wheels with BH. BZ or BZ resinoid bonds can take it because they are highly heat resistant.



GET TWICE THE EFFICIENCY from your floor or bench grinders by using Norton ALUNDUM wheels on both ends of your machines,



SNAG STEEL CASTINGS with portable grinding machines, using fast-cutting Norton ALUNDUM wheels.

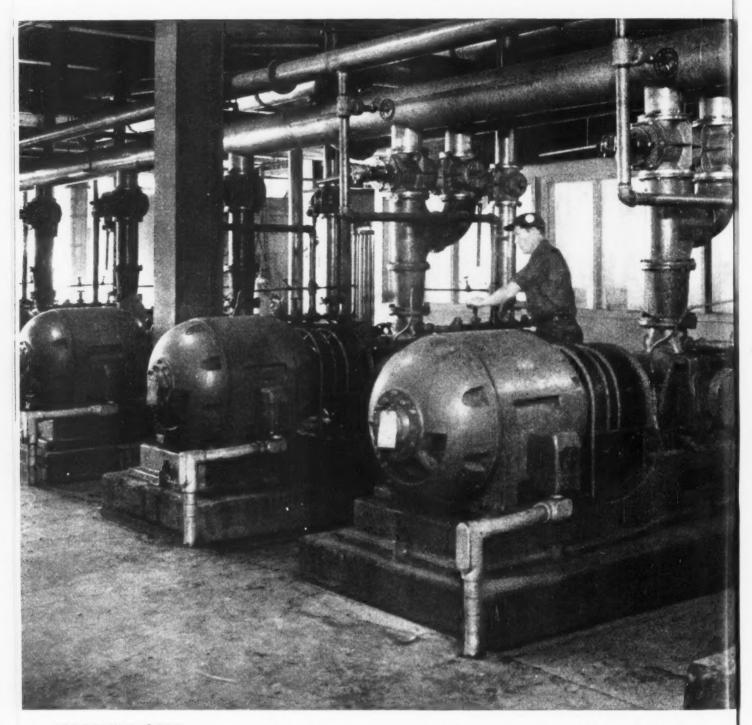


YOU GET WORK DONE FASTER...at lower cost... when you use Norton wheels, Shown here, Norton ALUN-DUM wheel grinding a sprocket.



STEP UP rate of stock removal from steel eastings by use of pressure bar on floor grinders . . . keep handling time to a minimum.

INDUSTRY'S FIRST CHOICE



MASONITE CORP. is among the many big industrial users that prefer Tri-Clad motors for the hard jobs. In fact, 85% of the motors in Masonite's huge West Coast

plant are G-E motors. Shown above is part of a bank of 200-hp Tri-Clad motors which drive refiners that brush out the exploded wood chips used in making Masonite boards.

GENERAL



ELECTRIC

FOR THE HARD JOBS.

TRI CLAD MOTORS

More than 10,000,000 horsepower of G-E Tri-Clad motors are now serving American industry. This is ample evidence that Tri-Clad motors are industry's first choice for the hard jobs-jobs where uninterrupted production is a must.

Here, for example, are reports from four more industries where G-E Tri-Clad motors are providing superior performance-with minimum maintenance-regardless of today's increasing production demands.

A MOTOR FOR EVERY NEED

In the Tri-Clad motor line, you have the widest selection of standard motors available today: ratings up to 2000 hp; all types of enclosures; gear motors, brake motors, and adjustable-speed drives-plus many other mechanical and electrical modifications to meet your requirements.

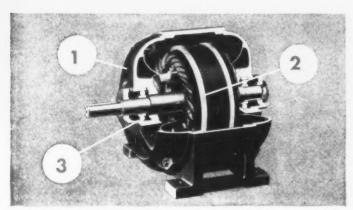
ENGINEERING HELP AVAILABLE

To get top performance from your machines, and to prevent costly shutdowns, G-E engineering specialists stand ready to help you plan your motor applications. And the most complete sales and service network in the motor industry assures you prompt attention to your motor problems.

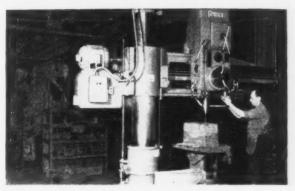
PROMPT DELIVERY

You can get standard G-E Tri-Clad motors right out of stock from G-E shipping points throughout the country. Contact your nearest G-E Sales Office or authorized G-E agent or distributor. General Electric Co., Schenectady 5, N. Y.

*Reg readiment of General Finter Co.



YOU GET TRIPLE PROTECTION with every Tri-Clad motor against 1 physical damage, with rigid corrosion and blow-resistant cast-iron frame; 2 electrical breakdown, with G-E Formex* wire which resists oil, heat, moisture, abrasion; 3 wear and tear, with completely enclosed bearings that last longer because they can be relubricated if necessary.



BELL AIRCRAFT CO. uses Tri-Clad motors throughout its plant. The Tri-Clad motor on this heavy radial drill has operated continuously for many years. Plant personnel can't remember a single interruption due to Tri-Clad motor failure!



HERSHEY CHOCOLATE CO. relies on Tri-Clad motors for hard jobs where shutdowns would be extremely costly. This Tri-Clad motor drives a cocoa mill —in continuous operation.



AMERICAN CRYSTAL SUGAR CO. reports complete satisfaction with G-E Tri-Clad motors on hard jobs. This Tri-Clad motor provides snappy starting ability needed by the compressor which supplies air to operating equipment throughout the plant, at Moorhead, Minn.



embody all the accumulated experience of our 50 years as **pioneers** in the art of broaching. This valuable "know-how" is put at your disposal every time you send us an order or an inquiry.

Being the world's largest manufacturer of broaching machines and broaches, it is of course to be expected that our facilities for producing broaches of any size or shape, in any quantity, cannot be equalled.

Recent plant expansion has still further increased our capacity to produce broaches . . . although we are already the largest producer of broaches in the industry!

It is definitely to your advantage, when you need

broaches, to look to the leader . . . look to LAPOINTE!



Send for our brochure on broaches. Ask for Bulletin B-9

LAPOINTE

THE WORLD'S OLDEST AND LARGEST MANUFACTURERS OF BROACHING MACHINES AND BROACHES



"Park La Brea", Metropolitan Insurance Company housing project

Los Angeles Times Photo

The Invisible Background of Industrial Progress

American Initiative — American Free Enterprise state and municipal planning, through new and modern housing developments are raising the standards of the American Way of Life for a large part of our one-hundred-and-sixty-million population. Illustrated here is "Park La Brea", a Metropolitan Insurance Company housing project in Los Angeles, California. This is typical of today's Modern City planning, incorporating up-to-the-minute home facilities including auto parking and recreational park areas. These projects encompass many phases and many industries for the production of construction equipment, materials, inbuilt equipment such as elevators, heating and air conditioning units and the wide variety of household appliances. In The Invisible Background of Industrial Progress are the builders of

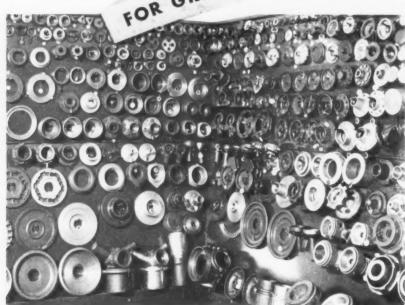
* Modern Machine Tools who provide basic manufacturing equipment to the infinite numbers of industries required to complete these huge developments. Bullard plays a singular part in American Progress and is proud of its contribution to the American Way of Life.

BULLARD COMPANY BRIDGEPORT 2 CONNECTICUT

* For greater manufacturing economy REFER to next page

BULLARD MACHINE TOOLS

FOR GREATER MANUFACTURING ECONOMY



From the time of the inception of the Mult-Au-Matie back in 1914 these machines in customers' plants have probably machined the largest variety of work of any machine tool. Illustrated herewith are only a few of many hundreds of Mult-Au Matic jobs. The machine's versatility suits it for nearly any type and shape of work where the operations call for boring, turning, facing, drilling, reaming and threading.

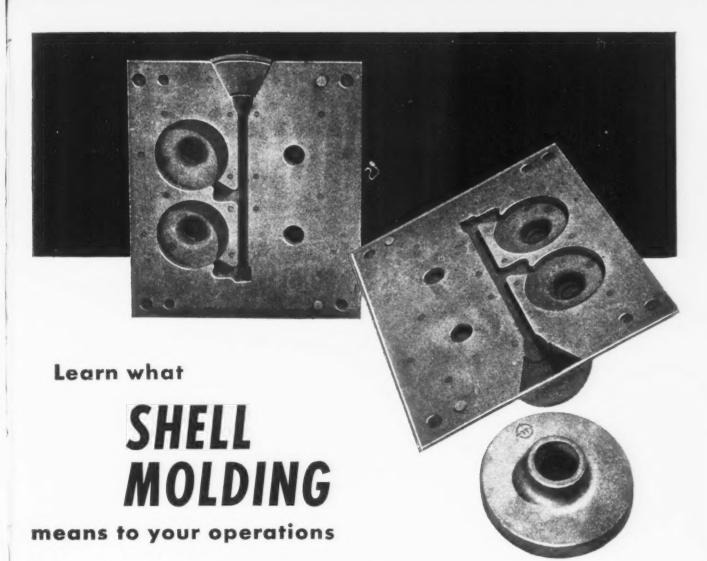
Motor manufacturing which includes pleasure ears. trucks, tractors, mechanical farm equipment and airplane engines is the largest user of these automatic multiple spindle machines. However other manufacturers contributing to the mining, shipbuilding, hydro-electric, ore, railroading, oil, bridge construction industries, scientific developments and modern housing projects have found the economy of Mult-Au-Matic production a large factor in the marketing of their products. Wherever automatic multiple spindle manufacturing can be efficiently used there is a place for Mult-Au-Maties with their attendant savings in manufacturing costs. Bullard engineers are ready to assist in applying Mult-Au-Matic efficiency to your particular manufacturing problems. Let us make a study of your production methods.

For Manufacturing Feonomy use Mult-Au-Mattey, Built in 8-, 12-, 16-, and 34-inch sizes with 4-6, 8-12, or 16 spindles according to the specific model.



THE BULLARD COMPANY

BRIDGEPORT 2, CONNECTICUT



Casting by Walworth Company New York 17, N. Y.

When you design ferrous and non-ferrous metal parts, be sure your plans take the *shell molding* process into consideration. This new method of foundry casting can bring real economic benefits. For instance,

- Less machining means lower production costs.
- Pieces are cast to closer finished dimensions—
 tolerances as close as .003 to .005 inches per inch.
- Castings have almost pattern-smooth surfaces.
- Higher percentage of sound, uniform castings results in fewer rejects.

Thin, lightweight shell molds made of fine-grained sands bonded with BAKELITE Phenolic Resins are the feature of this process. Your foundrymen can tell you how it can serve your needs. Write Dept. EN-44 for information on the BAKELITE Phenolic Resins developed expressly for shell molding.

BAKELITE

PHENOLIC RESINS FOR SHELL MOLDING



BAKELITE COMPANY

A Division of

Union Carbide and Carbon Corporation 30 East 42nd Street, New York 17, N. Y.

UEE

In Canada : Bakelite Company (Canada) Ltd., Belleville, Ont. DIE CASTING is the Process...

number 2

ZINC, the Metal...

BUNKER HILL, the Preferred Zinc



ZINC ALLOYS are used to the extent of approximately 60% by weight of all die cast parts consumed annually in the United States, largely because of economies resulting from the ease and speed with which they can be cast. The low casting temperature (750 to 800 F) of these alloys results in low fuel cost, low die cost, and low die maintenance. The castings are dimensionally stable, have excellent mechanical properties and can be economically polished, plated, painted, or finished by other processes. Zinc alloys also have high fluidity at casting temperatures. Die castings of highly complex design needing little or no machining can thus be readily produced.

The ability to cast zinc alloys of remarkable smoothness keeps finish-

ing requirements to a minimum. Frequently, only buffing is necessary prior to plating in brass, nickel or chromium, or for the application of other types of finishes. This is a primary reason for using zinc base die castings almost exclusively for hardware and decorative applications, especially in automobiles and countless other consumer products. The production of the most intricate zinc alloy castings has become an everyday job.

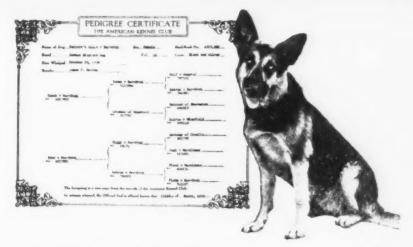
Today, die castings based on zinc are a vital factor in modern engineering processing, and their range of applications is constantly being breadened as industry comes to appreciate the advantages and the extent of the economies that zinc base die castings yield.

Eastern Sales Agents: ST. JOSEPH LEAD CO., 250 PARK AVE., NEW YORK 17

BUNKER HILL 99.99+% ZINC

Sales Office for Pacific Coast: NORTHWEST LEAD CO., SEATTLE, WASH.

THE SMOOTH-HAIRED GERMAN SHEPHERD is considered by many the king of the working dogs. He is loyal, suspicious of strangers, easily trained and has unusually keen senses of sight and smell. Average height of the breed is 24 inches.



To guard against shipping damage

Use the Box with the Pedigree



When you order boxes with a pedigree you can be sure the carload shipments you receive will measure up to the same high standards as submitted samples or previous shipment,

That's why Gulf Oil Corporation relies on Union boxes to protect its cans of famous Gulf Oil from refinery to service stations all over the country.

Every month more makers of famous brand products are shipping in Union boxes.



Dependable Packaging Since 1872

UNION Corrugated Containers UNION BAG & Paper Corporation

Principal Offices: WOOLWORTH BLDG., NEW YORK 7, N. Y.

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Extreme Accuracy





"TYPE I" HAMMER FOR CLOSED or OPEN DIE WORK

The NAZEL "Type I" is the only Electro-Pneumatic Forging Hammer with adjustable external guides . . . increased accuracy is assured since the ram is held tight within these guides. Precise alignment at all times is further assured, because the base is machined to exactly fit the machined anvil, preventing any movement of the lower die. In addition, due to the minute degree of control, the NAZEL can hit the hardest or the lightest blow with no adjustments whatsoever.



FREE-Write for your copy of our helpful Forging Hammers Bulletin, today!

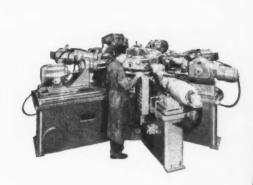
1836

LOBDELL UNITED COMPANY

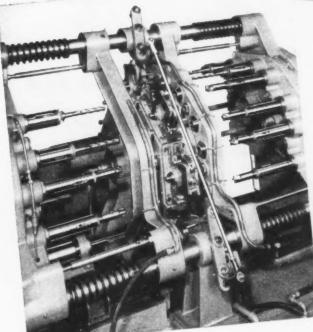
WILMINGTON 99, DELAWARE A SUBSIDIARY OF UNITED ENGINEERING AND FOUNDRY COMPANY

1952

closeups of drilling & tapping PRODUCTION







The Hartford Special machine above is drilling, tapping and chamfering side pad holes in compressor rear frames.

The machine at the left, using a vertical dial, is core drilling, rough and finish reaming, rough and finish facing and chamfering two rockers simultaneously.



When it comes to production -

SUPER-SPACERS

GE



Automatic THREAD ROLLERS





THE HARTFORD SPECIAL MACHINERY CO., HARTFORD 12, CONN.

SHELL INDUSTRIAL



bring greater under extreme

FOR GEARS... SHELL MACOMA OILS

FOR ENCLOSED GEARS, Shell Macoma Oils solve the problem of extreme pressure lubrication with seven distinct advantages:

- 1. Extreme load carrying capacity . . . remarkable ability to prevent wear and seizure . . . even after long periods under heavy load.
- **2.** Long-lasting oxidation stability . . . plus freedom from sludge formation in the presence of water.
- 3. Outstanding adhesion . . . maximum

protection against rust, and against leakage through worn bearings and seals.

- **4. Non-corrosive** . . . will not cause corrosion of steel or alloy bearings.
- 5. Non-Foaming . . . Shell Macoma Oils successfully overcome the tendency to foam caused by aeration of oil in the gear chamber.
- 6. Speedy water separation.
- 7. Complete stability in storage and in service... no tendency to separate, even in extremes of heat and cold.



Be sure to get all the facts about these Shell Macoma Oils. Check the coupon and attach to your letterhead for full information.



Two great products of

EP LUBRICANTS

safety to gears and bearings loads and adverse conditions

FOR BEARINGS.... SHELL ALVANIA EP GREASE

For grease-lubricated bearings, Shell Alvania Grease . . . the one grease that serves all grease applications in the majority of plants . . . now is available with EP qualities added! . . . now even more Multi-Purpose.

All of these unique advantages of Alvania Grease are therefore available for the first time to operators of machines subject to extreme bearing pressures:

- 1. Higher mechanical stability than any conventional grease at operating temperatures.
- **2.** Pumpable at low temperatures . . . even through centralized lubrication systems.
- 3. Stable at high temperatures . . . no phase changes—still a grease at high temperatures—still a grease upon cooling.
- 4. Resistant to water . . . won't wash out.
- 5. Longer service life . . . reduced consumption.

Shell Alvania EP Grease is the answer to some of the toughest lubricating problems in industry. In rolling operations, for example, operators of steel, rubber, plastic and paper mills report that this grease film just won't be ruptured, regardless of shock rolling load!

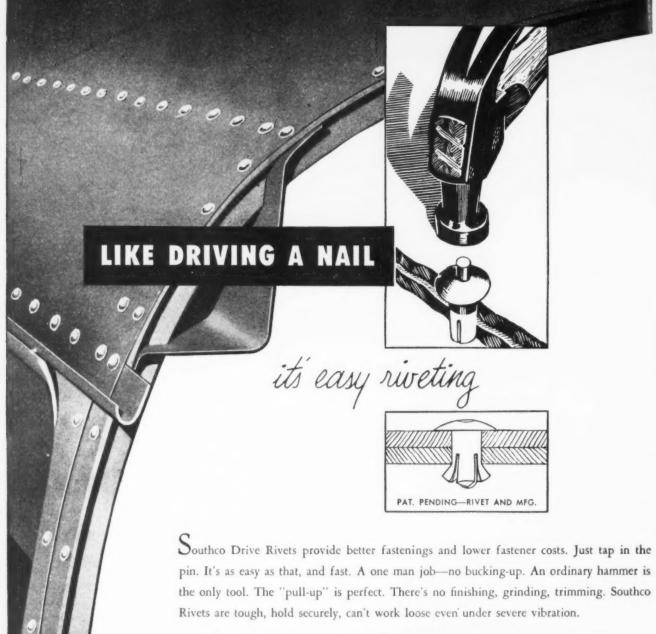
Check the coupon and mail today for additional information about Shell Alvania EP Grease.

Shell Oil Company
50 West 50th Street, New York 20, N. Y.;
or 100 Bush Street, San Francisco 6, Cal.
Please send available data on

Shell Macoma Oils

Shell Alvania EP Grease
Name
Company
Title
Address

SHELL OIL COMPANY



Wherever rivets are used, for securing heavy truck panels, or delicate instrument assemblies, metal to metal or metal to wood, use Southco Drive Rivets for speed, for low cost, for secure fastenings. Ask for complete data. Southco Div., South Chester Corp., 1411 Finance Bldg., Philadelphia 2, Pa.

Important for military contractors! Prompt deliveries now possible.

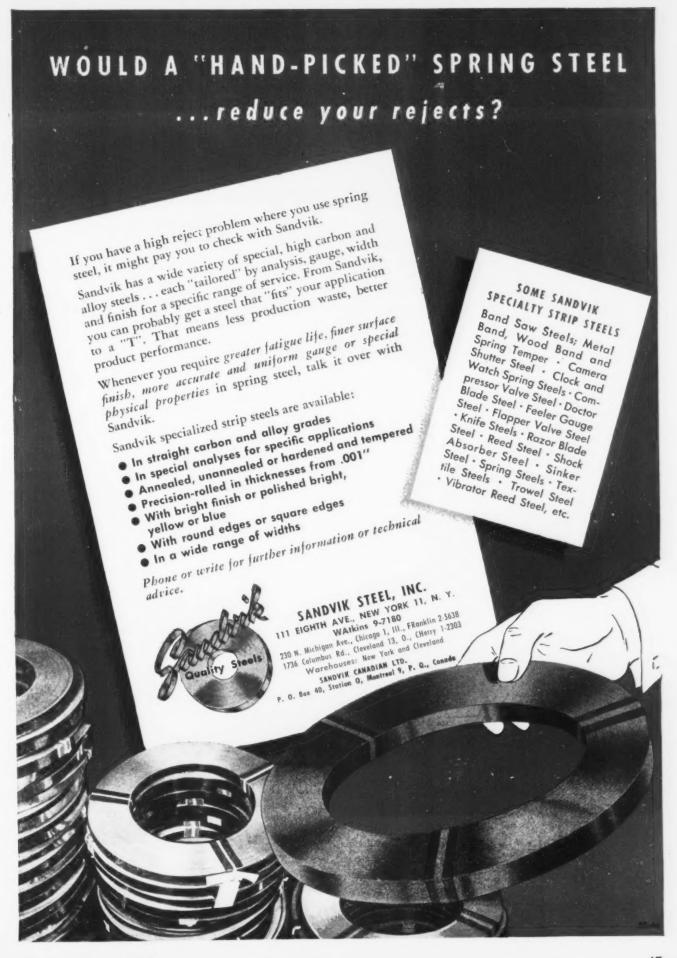
SOUTHCO

FASTENERS

PAWL - SCREW AND SPRING -DRIVE RIVETS - ANCHOR NUTS -ENGINEERED SPECIALTIES

OFFICES IN PRINCIPAL CITIES

WHEREVER TWO OR MORE PARTS ARE FASTENED TOGETHER; STANDARD AND SPECIAL DESIGNS FOR IMPROVED PERFORMANCE AND LOWER PRODUCTION COSTS



November 13, 1952

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E S

AGE

47

Why Engineers Specify



Engineers don't buy gears from us because they like the way we part our hair. They check the facts, make up their own minds.

Some of them, we are beginning to believe, know even more about the advantages of Cone-Drive gears and reducers than we do.

As part of a field study, we asked a number of them why they adopted Cone-Drives. The tables show what they told us.

We were not surprised at the frequency with which 'lower cost,' 'space saving' and 'more capacity' showed up. After all, in standard Cone-Drives you automatically get more load capacity in a smaller, lower cost 'package'. But some of the other reasons checked by users are quite thought provoking.

Worth looking into? We'll be glad to send you any technical data we have. Just drop us a line.

And now ...

ANOTHER Cone-Drive ADVANTAGE!

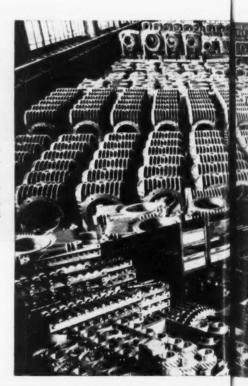
Replacements from stock on all standard gear sets, mountings and reducers if you should ever need them.

ask for

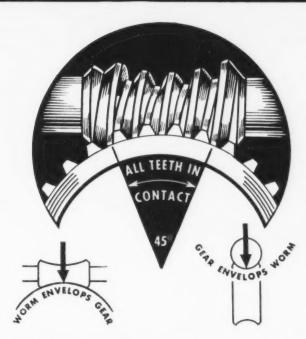
Literature Available

For Executives
Standard Gear sets
Standard Reducers
Standard Couplings
Cone-Drive in Machine Tools
Cone-Drive in Materials
Handling
6 Ways to Cut Costs
Applications Reference Sheet
**

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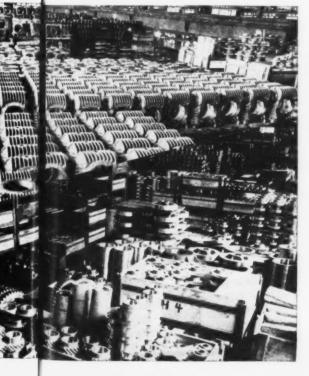


Standard CONE-DRIVE GEARS



Cone-Drive gears and reducers derive their advantages primarily from the fact that the gears and worms are double-enveloping. This means greater contact per tooth, more teeth in contact, better load distribution, increased capacity, longer life, lighter weight, smoother operation, higher safety factor, ability to resist shock loads, freedom from service trouble—and lower overall cost.

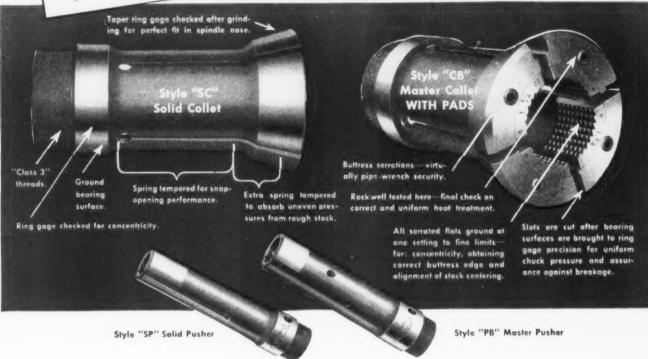






Memoto the users of
45,000
Acme-Gridley
Automatics

OF NAMCO COLLET PERFORMANCE:



National Acme collets and pushers are built by National Acme for National Acme machines and are available only from National Acme.

This is important for you to remember. It is your positive assurance of top performance. These National Acme components are made to function properly on your Acme-Gridley—designed on the basis of our fifty years' experience with the stock feed functions of this type of machine.

We offer you no trick designs—just sound engineering practice, enabling us to assume the same

responsibility for the high performance of these stock feed components as we do for the machines to which they are engineered. For peak performance specify Nameo, both for multiple and single spindle Acme-Gridley automatics and for the pushers, collets and pads used on them.

Complete details and prices on all National Acme collets, pushers, pads and bushings for Acme-Gridley automatics are contained in a separate Stock Feed Components Catalog, No. CP-49. Ask for your copy.



The NATIONAL ACME CO.

170 EAST 131st STREET . CLEVELAND 8, OHIO

Acme-Gridley Bar and Chucking Automatics: 1-4-6 and 8 Spindle • Hydraulic Thread Rolling Machines • Automatic Threading Dies and Taps • The Chronolog • Limit, Motor Starter and Control Station Switches • Solenoids Centrifuges • Contract Manufacturing

Amazing "Friction" "Friction" Fighter"

extends bearing life as much as 17½ times... stops oil drippage!

Saved \$1275 on one machine!



Now from Alemite—world leader in lubrication—comes this great friction fighting achievement. Alemite Oil-Mist! The most efficient, continuous, fully automatic system in the field of machinery lubrication.

Alemite Oil-Mist! The system that atomizes oil into <code>mist</code>—distributes it through tubing to bearings—bathes <code>all</code> bearing surfaces with fresh, clean, cool oil film. A system that simplifies and materially cuts the cost of machinery lubrication. And the lubricator unit has no moving parts.

Oil-Mist uniformly maintains oil film on plain and anti-friction bearings, gears and chains regardless of variations in load, temperature or speed. Eliminates the "human element."

Here! Direct from a field report is the latest proof of Oil-Mist results!

Before Oil-Mist: 100 hours was the average life of spindle bearings on the precision grinder of a leading manufacturer. Cost of each replacement—\$85 for the bearing and labor, *Plus* downtime.

After Oil-Mist: The same grinder has run 1,638 hours without a bearing replacement! Total saving to date: \$1,275 (after deducting both the cost of the Oil-Mist unit and installation).

*Name on request

ALEMITE OIL-MIST Lubricates All Types of Mechanisms



GE









Alemite OIL-MIST Lubrication

Check All These OIL-MIST Advantages!

- Reduces bearing temperatures as much as 20%.
- Continuous, uniform lubrication of all bearings.
- Air pressure seals bearings against dirt.
- Reduces oil consumption up to 90%.
- Prevents product spoilage.
- Eliminates guesswork—each bearing picks up as much Oil-Mist as it needs.
- Reduces starting and running torque

Get the Facts NOW!

Alemite, Division of Stewart-Warner, Dept. N-112 1850 Diversey Parkway, Chicago 14, Illinois

Please	send	me	Q	FREE	copy	of your	new	and	complete
Oil-Mi	st Ca	talo	a.						

Please have your Alemite Lubrication Representative arrange a desk-top demanstration of Oil-Mist. This entails no cost or obligation on my part.

My name

Title

Compan

Street

City

Stat



A COMPLETE ALUMINUM SCREW MACHINE PRODUCTS SERVICE UNDER ONE ROOF

When your designs call for aluminum screw machine products, consider Alcoa's Edgewater, New Jersey, plant. Here, under one roof, are complete machining facilities, plus secondary operations such as finishing, assembly and packaging.

Alcoa has machine capacity for long production runs of parts through 3½" O. D. The quality of Alcoa work is backed by 30 years

of producing screw machine products and 64 years of working with aluminum. Your local Alcoa sales engineer is eager to help with design details and suggest ways to apply aluminum to your products. Through him, you are offered the facilities of the world's greatest aluminum research laboratories. Look for your local Alcoa sales office listed under "Aluminum" in the classified phone book.

ALUMINUM COMPANY OF AMERICA 852-L Gulf Building

SECONDARY OPERATIONS

These pictures show only a few of the many secondary operations available at Alcoa. Below—one of Alcoa's heat-treating furnaces and quenching baths. At right—applying a ball burnish finish to parts in tumbling barrels. Other secondary operations include: burring, tapping, thread rolling, drilling, milling, slotting, press forming, stamping, marking, plus all types of mechanical and chemical finishes.

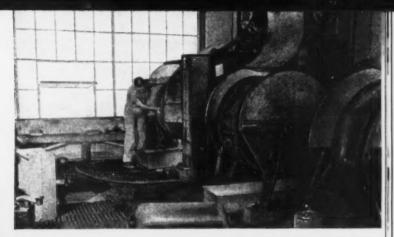


CONSTANT INSPECTION OF TOOLS AND GAGES assures delivery of parts within the tolerances you specify.



Pittsburgh 19, Pennsylvania







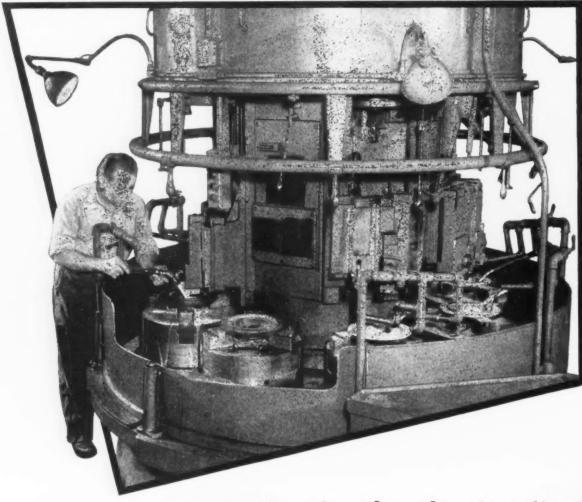
SCREW MACHINE CAPACITY at Alcoa includes turret lathes, singleand multiple-spindle automatics.



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- Quantity production of identical gears offers a challenge that we here at BRAD FOOTE are eager to accept.
- Multiple spindle machines, duplicate machines, numerous and varied machines, every machine that's needed—PLUS men of long experience making close tolerance gears . . . these factors make it possible for us to confidently accept such a challenge.
- When you specify BRAD FOOTE gears, you do so with the knowledge that each gear will be made to exact specifications; that every gear of a quantity will be identical in structure, in size, and in appearance; that each operation on every gear will be performed by BRAD FOOTE people in BRAD FOOTE shops. No one will share our responsibility.
- You will be satisfied with the BRAD FOOTE gears you buy because they will give long, economical service on the equipment you operate, or on the machines you sell to others.
- Your inquiries are invited.

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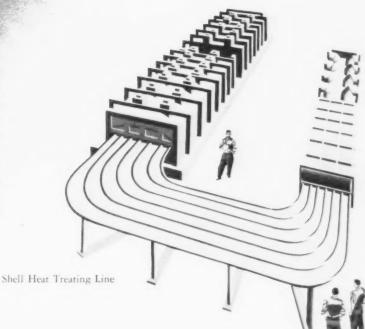
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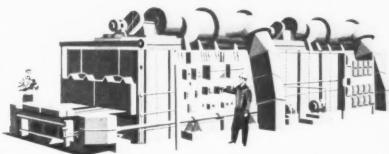
AMERICAN GEAR & MFG. CO. • PITTSBURGH GEAR COMPANY

Phone: Lemont 920 Lemont, Illinois Phone: ATlantic 1-9950 Pittsburgh 22, Pennsylvania

Specialists in Furnaces for Defense

The well-trained and highly-experienced furnace entineers at Salem-Brosius have designed and built a great many eminently successful furnaces for heating and heat treating ordnance and aircraft parts. As a result, they are known as specialists in the field. Though, among them, they have produced just about every type of heavy furnace in use today, they take certain pride in their reputation for producing defense units. It implies some assistance in building America's strength. You'll find that a Salem-Brosius Defense Furnace cuts cost and adds production because it is excellently designed, well constructed, and contains many special features not elsewhere available.





Aluminum Billet Heating Furnace

Gun Barrel Hardening Furnace

Remember, if you have a problem that involves the use of industrial furnaces, blast furnace equipment, or charging and manipulating machines, it will pay you to call on Salem-Brosius today.

SALEM-BROSIUS, INC.

SALES AND EXECUTIVE OFFICES: 248 FOURTH AVENUE, PITTSBURGH 22, PA.
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RIGHT ANGLE

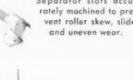
Roller ends, precisely square to avoid end-rub, oscillation and side-shock.

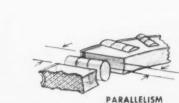
RIGHT ANGLE

Bearing surfaces with paral-lelism that results in unwavering right-line rolling.

RIGHT ANGLE

Separator slots accurately machined to pre vent roller skew, slide and uneven wear.





DESIGN Reduces Maintenance Costs and Shut-Downs

ANGLE

RIGHT

In a Rollway Radial Bearing there's no wedging of the rollers . . . no pinch out . . . far less roller end rub and wear back. Rollway's Right Angle Design reduces rubbing friction to a minimum - results in less service attention, longer life expectancy under heavy duty service.

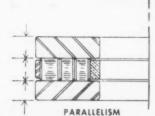
In Thrust Bearing applications, accurate parallelism between the rollers and the matched thrust plates is repeated in the parallelism between the separator slots and the rollers themselves - all adding up to quietness, equalized wear and longer life.

Our complete engineering and metallurgical services will gladly work with you on your problems. Simply write or wire any sales office. No cost. No obligation.

Rollway Bearing replacements are available through authorized bearing distributors in principal cities. Consult your classified 'phone directory.

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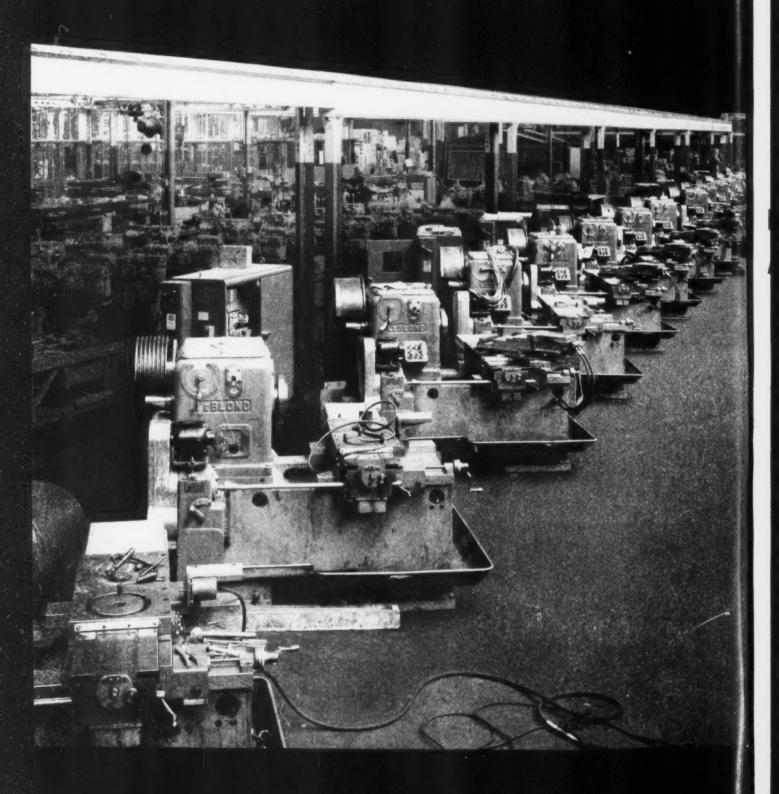
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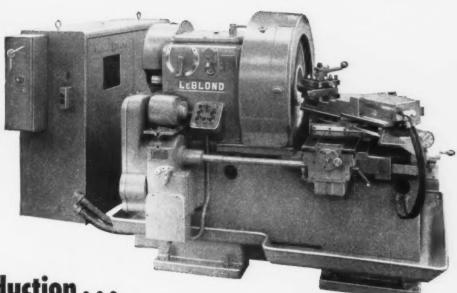
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For either steel or aluminum.

Fully automatic cycle to center or across center.

Automatically-controlled constant cutting speed.

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Double-cylinder tracer for complicated discs.

Also available with power angular feed compound rest in place of hydraulic tracing unit.

For further information write . . .

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WORLD'S LARGEST BUILDER OF A COMPLETE LINE OF LATHES . FOR MORE THAN 64 YEARS

November 13, 1952

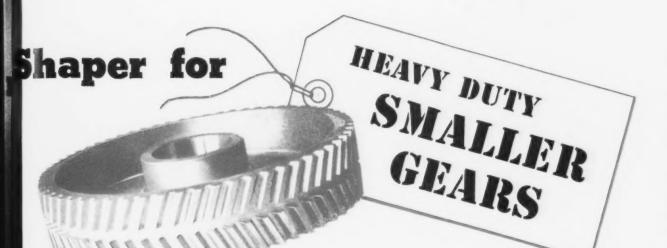
The A Gear





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as well as those

UP-TO-36" CAPACITY

May we emphasize, once again, that the 36-Type Gear Shaper cuts small gears fast, too. More machines are bought for roughing and finishing 8, 10, 12 and 14 inch gears than for the sizes closer to its maximum limit of 36" pitch diameter.

The secret of the ability of a 36-Type to cut costs—on the run of intermediate size work—as well as big gears—lies in its "beefed-up" design You can take heavy cuts at high speed, and still hold to precision limits.

Wire, write or phone the Fellows Office nearest you whenever you have need to discuss ways of reducing costs on gear tooth machining operations.



THE FELLOWS GEAR SHAPER COMPANY • Head Office and Export Department: 78 River Street, Springfield, Vermont, U.S.A. Branch Offices: 323 Fisher Bldg., Detroit 2 • 5835 West North Ave., Chicago 39 • 2206 Empire State Bldg., New York 1

HOLDING A CLOUD-BUSTER'S BREATH

Low pressure breathing oxygen cylinders must be perfect...there are no re-fills at 40,000 feet.

Many things can happen at 40,000-plus. But today's precision-trained sound-busters can usually handle them all. But let their vital oxygen supply go wrong and in a matter of seconds there is nothing that can be done.

To meet rigid service specifications, D. K. Manufacturing used Thor-Tung electrodes and Heliwelding. Using both the manual, water-cooled Heliweld holder for welding spuds into position, and the Heliweld Automatic Head for production line runs while welding cylinder halves, D. K. turns out breathing oxygen cylinders which test a leak-free 700 psi – hundreds of pounds above working pressure requirements.

Inert gas-shielded Heliwelding eliminates the need for flux . . . prevents slag formation—permitting 'clear view' operation. Its gas-shielded electrode provides a highly concentrated arc . . . permitting exceptional welding speeds with a minimum of distortion.

Production-running these oxygen lifesavers is just one of the countless jobs Heliwelding can do in your plant or shop. Find out how it can be used for you. Write... or phone your nearest Airco Office. Ask for your copy of ADC-709: "Heliwelding-Catalog 9".



Completed Breathing oxygen cylinders.





Manufactured by the D. K. Manufacturing Company, Chicago, Illinois, breathing oxygen cylinders like those above must be the products of perfect welding. To insure perfection on a production-run basis D. K. uses Heliwelding for their construction.



Companion-piece of the Heliweld Automatic Head, this jig-mounted manual, water-cooled Heliweld Holder fastens outlet spuds at the rate of nearly two hundred a day to begin the production run of oxygen breathing cylinders for D. K. Manufacturing Co.



DEALERS

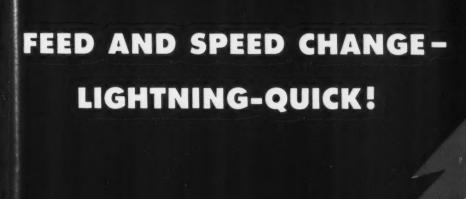
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DIVISIONS OF AIR REDUCTION COMPANY, INCORPORATED





Part—Clamp Post; Material—X-1315 Steel; Preselected Spindle Speeds— 5: Cuts required—10; Time per piece—40 seconds; Setup Time—35 minutes

SPEEDI-MATIC FEATURES

- Automatic electronic speed change, preselected for as many as nine stations.
- Automatic electronic feed change, preselected for as many as six stations.
- Infinitely variable range of spindle speeds—40 to 4000 rpm.
- Feeds from 18" to 16" per minute.
- Quick-acting, spring-return, hand-operated cut-off slide.
- Air-fed pusher-type collet attachment.
- Collet chuck capacity- 38".

PRESELECT Any 9 Spindle Speeds...40-4000 rpm AND PRODUCE!

For peak screw machine production, take a good look at the Monarch Speedi-Matic. This electronically-controlled lathe, with instant preselected speed and feed changes in a wide stepless range, saves as much as 50% on production times. Add its average 45 minute setup time—without feed cams, and you see why it has proved unbeatable in runs of 25 to 2000 or more pieces.

The preselected speed and feed settings can be made for all six turret stations; the preselected speed settings for cross feed slide operations. Being wide in range and infinitely variable, they provide better finishes

and closer tolerances—toolroom accuracy at production line speeds.

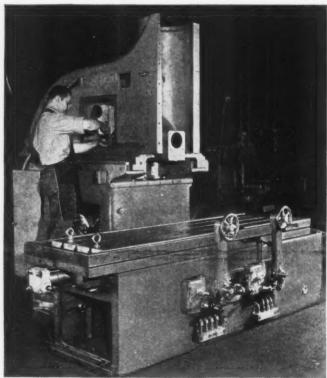
The Speedi-Matic, to repeat, stands for speed—with Monarch standards. It has won a name in metal-working circles as "The world's fastest hand screw machine." And we've got performance records and job data to back up that name—all neatly presented, with specifications and complete information, in our illustrated Booklet No. 1903. For this booklet—or information on other Monarch turning equipment—simply write us on your letterhead . . . The Monarch Machine Tool Co., Sidney, Ohio.

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FOR A GOOD TURN FASTER . . . TURN TO MONARCH

Engineered Rebuilding

How Simmons Methods Increase Machine Tool Output and Efficiency



Mechanical and hydraulic controls on both table and ram make rebuilding this Hydro-Tel a complex job. Valves must seat perfectly; adjustments are exceptionally precise.



Main spindle bearings are checked for runout and eccentricity. All bearings are tested and replaced if not up to standard. New bearings, used as replacement, are also tested prior to installation.

Complex Hydro-Tel completely rebuilt in twelve weeks

A manufacturer of dies, faced with the need for increasing production, learned that new machine tool deliveries meant a year's wait. So instead of waiting, he asked Simmons engineers to rebuild a veteran 16-inch Hydro-Tel.

Simmons stripped it down to the bare castings, cleaned it, and replaced worn parts and refinished sliding surfaces. They rebuilt its entire hydraulic-mechanical control system to the specifications of the original manufacturer. Seating the hydraulic valves and adjusting the hydraulic controls called for precision of the highest order.

From start to finish, the job was completed in 12 weeks. And now the machine is back in service, performing satisfactorily. In fact, the manufacturer has since sent Simmons a second Hydro-Tel, which is currently being rebuilt.

Will rebuilding work for you? It's easy to find out: simply send a list of your machines that might be rebuilt to meet new problems. We'll promptly quote prices and deliveries and send you our quarterly, "The Simmons Way."

SIMMONS MACHINE TOOL CORPORATION 1721 North Broadway, Albany 1, N. Y.

SIMMONS GIVES USED MACHINE TOOLS A NEW LEASE ON LIFE



How "Excited Atoms" Insure Correct Steel Analysis

HERE'S the quick, modern way J&L chemists make sure steel contains the exact amounts of certain elements specified on the customer's order.

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First, a polished sample of the steel being analyzed is placed in this electronic apparatus called a "spectrograph." The sample acts as an electrode and creates an arc. The atoms are excited by the arc and throw off a beam of light.

The light rays, passing through a prism, are separated into various wave lengths and are photographed as separate fine lines on film. Each element appears on the developed film in its own characteristic density of line. Another instrument, the "densitometer," measures the line density, which the chemist quickly calculates into percentage.

The spectrograph analysis, done in a few minutes, assures the customer that his steel is made to the analysis he specified.

It's just one of the many functions of Jones & Laughlin Steel Corporation quality control, going on constantly behind the J&L trademark, to insure the quality of steel in better products for you.

JONES & LAUGHLIN STEEL CORPORATION PITTSBURGH 30, PA.

NOW...HIGH-TORQUE, LOW-SPEED Trouble-Free Roller-Table Operation WITH RELIANCE Floating Worm Gearmotor Drive

Mounted directly on the roller shaft . . . the Reliance Floating Worm Gearmotor enables roller tables to operate continuously, unaffected by roll warpage or misalignment. External gears and couplings and heavy foundations are no longer required.

The Floating Worm Gearmotor meets requirements for a-c. or d-c. drives operating at speeds from 25 to 300 rpm, with output torque ratings of 25 to 450 ft.-lbs. continuous, and 1350 ft.-lbs. peak. Ratings up to 150 ft.-lbs. continuous, and 450 ft.-lbs. peak, are currently available.

For more details, call the nearest Reliance Sales Office or write for Bulletin F-2051.



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Connecticut. for eyelet machine products







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LINDE'S News of Metalworking

Worn Parts Rebuilt Economically by UNIONMELT Welding

Repair of worn tractor parts is most practical and economical with specially developed fixtures on which standard Unionmelt welding units are mounted. The metal deposited by Unionmelt welding is so smooth that no grinding or finishing is required. Experience indicates that resurfaced areas will wear as long as new parts.

The Berkeley "Conservall" fixture is designed especially for rebuilding crawler tractor track links or rails without disassembling them. The track is placed in a trough and clamped in position. A Linde side-beam carriage

Tractor rail links rebuilt in "Conservall" machine by Unionmett welding. Cams automatically control welding action for each link.

moves the UNIONMELT welding equipment over the positioned track and the welding of each link is automatically started, stopped, and accurately controlled. Rollers, idlers, sheaves, and other circular work can also be welded or resurfaced on another section of the machine.

The "Leader" machine is also available for rebuilding both cylindrical and flat parts. Rollers are rebuilt on top of the machine. Larger parts, such as idlers, are mounted in the chuck at the side of the machine as shown. With the flat work attachment, parts such as disassembled track rail links, grousers, bulldozer blades, end bits and fabricated members can be resurfaced easily. This attachment is operated by a gear which is mounted in the chuck.



These tractor rollers and an idler were rebuilt at a speed of 30 in. per min. by UNIONMELT welding.

With both machines, the wheels can be tilted for rebuilding the flanges. It takes only 80 to 90 minutes to rebuild a D-8 track roller. Idlers take about three times as long.

Oxweld 1928 rod is normally used in making these repairs. When wear is excessive, Oxweld 296 rod is sometimes used for the initial buildup which is then finished with Oxweld 1928 rod. For such resurfacing, use either Grade 80 or Grade 90 Unionmelt welding compositions.

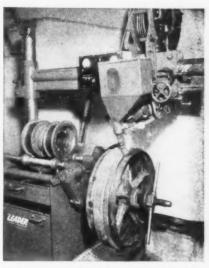
For some services, a finishing pass with a higher alloy tube rod is applied to produce a harder surface. While material of almost any hardness can be applied, one combining hardness and toughness lasts longer than one of higher hardness that tends to spall and chip. As deposited, Oxweld 1928 material has a hardness of about Rockwell C-25, but in service the working

surfaces actually develop properties which cause them to outwear deposits that are substantially harder.

Advantages of UNIONMELT Build-up

Unionmett welded resurfacing is especially attractive with these automatic machines which readily permit deposit rates of 20 lbs. per hour. Savings in time and the advantages of a smooth uniform deposit justify the initial investment in automatic equipment. Important in these times is the conservation of metal realized with the process. The use of approximately one hundred pounds of weld metal saves replacement of 2,000 to 3,000 pounds of new parts.

Linde's engineers and technicians will be glad to give further information about Unionmett welding. Telephone or write today.



UNIONMELT welding head on "Leader" fixture rebuilds rollers and idlers. Rollers are welded on top of the machine, idlers at the side, and flat parts, depending on their size, can be welded on top of the machine or in the flat work attachment.

LINDE AIR PRODUCTS COMPANY

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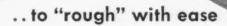
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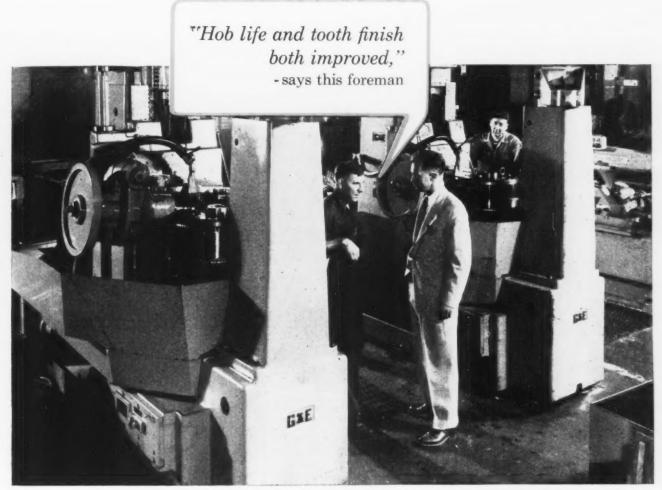
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HIGH PRODUCTION TOOLING



Tto AUTOMATIC . . éto FAST . . éto ACCURATE

FEATURES: Turret (work spindle carrier) turns continuously, grip of holding fixtures automatically releasing for operator to unload and load. Tools move horizontally for facing operations . . . other tools vertically for turning operations. Machine is designed for dry or wet cutting of light jobs, boring piston ends, facing, turning bands, ogives, etc.

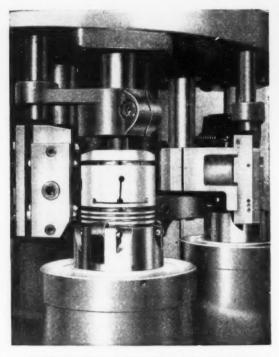
The turret is driven through worm and gears . . . spindles mounted in roller bearing and driven by helical gears. Changes in all speeds are easy . . inexpensive. Convenient spindle control station at left, control at right for turret and tool arms . . . arranged to prevent feed of tools to work unless spindles are revolving. Both turret and spindles are driven by V belts. Electrical equipment is enclosed, wiring concealed.

Left: Front view, showing splash guards for wet cutting.

Right: A close-up view of typical tooling set-up.



The machine mounts four 5" chucks on a spindle circle of 18". Spindle speeds 240–860 r.p.m. Longitudinal tool stroke $3\frac{1}{4}$ "... cross tool stroke $2\frac{3}{4}$ ". Feeds .001" to .030" per revolution. Spindle drive 3 to 5 H.P. with push button control; machine drive 1 H.P. Spindle carrier cycle time 12–38 seconds. Production time 3–9 seconds per piece. Cutting time 9–28.5 seconds. Now's the time to "ask Baird about it."



HORIZONTAL AND VERTICAL TOOLING

THE BAIRD MACHINE COMPANY

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From Billets to Boilers...



From charging the specially designed revolving furnace with a steel billet (above), through the many steps of production, every Globe function is specialized to produce steel tubes of unvarying high quality. (At right) Globe's Physical Laboratory one of the many labs in Globe's House of Science.

LOBE specialization assures you uniform high quality in alloy steel tubing

When you specify tubes for pressure or mechanical applications, quality determines the degree of safety and the length of trouble-free service you'll get.

For more than three decades, specialization in the production of uniform high quality steel tubes has key-noted all Globe research, engineering, and manufacturing operations.

It's this specialization that assures you dependable, uniform high quality in all Globe products.



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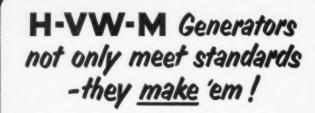
GLOBE STEEL TUBES CO., Milwaukee 46, Wisconsin

TYPICAL ANALYSES Carbon Moly.

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Yes, today's performance standards are higher than ever for motor generator sets. And the final examinations that all H-VW-M low voltage motor generators must pass before delivery have consistently raised industry standards for voltage regulation, power factor correction, overload capacity, and exceptionally long and efficient life for all parts. It's a painstaking, exacting process, but the net result is a line of generators that can't be beat.

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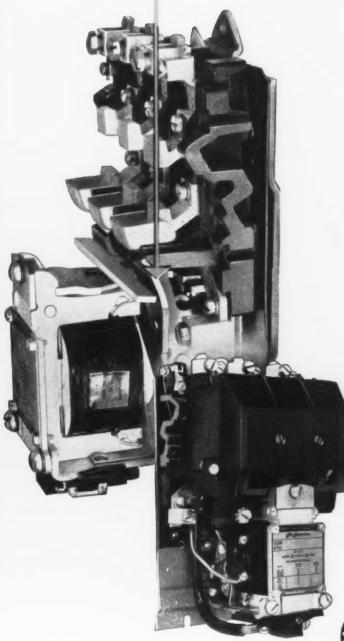
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Long, trouble-free, dependable service . . . with Westinghouse NR Contactors!

Here you have a contact closing arrangement designed with fewer moving parts! The entire contact assembly pivots on a knife-edge of specially hardened steel. As a result . . no sliding surfaces to bind or wear . . . no misalignment troubles. Friction is at a minimum! Jamming and sticking are eliminated! Nothing need be lubricated!

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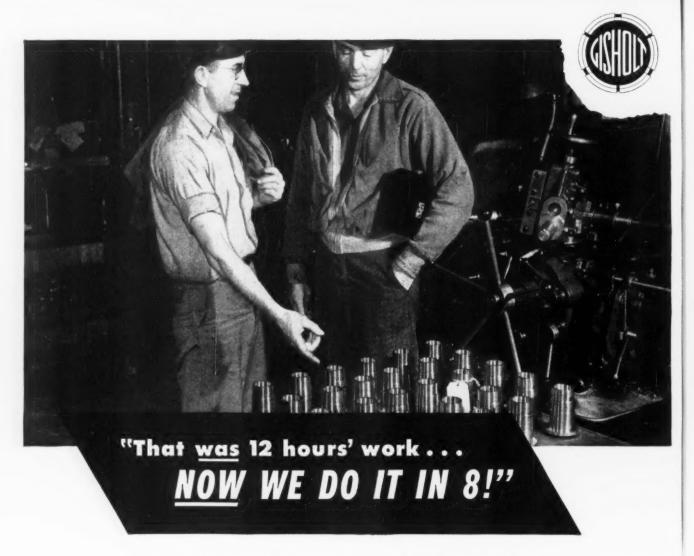


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Yes, the operators who've struggled along with older turret lathes will tell you: A 50% increase in production is not unusual when you replace with new Gisholt Ram Type machines.

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Automatic indexing and clamping of the hexagon turret saves more time. These are a few of the modern features that give you the smooth production rhythm that insures higher overall efficiency.

THE GISHOLT ROUND TABLE rep-

Add to these the power and rigidity to take multiple cuts and you have the unbeatable combination that means bigger production and lower costs. It's the performance that will "buy off" your older machines. Replace with modern Gisholt Turret Lathes.

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The superior quality of this new source of dolomite means the continuance of BAKER'S MAGDOLITE'S leadership within the industry ... and guarantees top performancefor you. Yes, those who know insist on BAKER'S MAGDOLITE ... the original deadburned dolomite!

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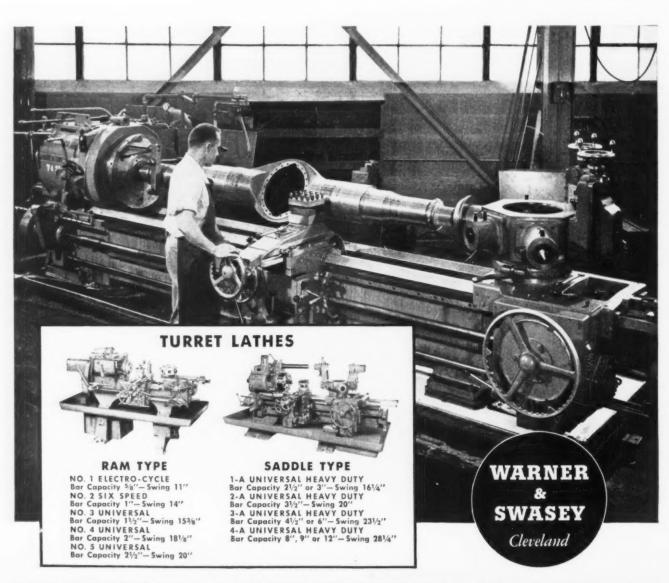
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• This Warner & Swasey in the plant of a large road machinery builder is a good example of what we mean when we say Warner & Swasey Turret Lathes are built in sizes and capacities to handle all sorts of jobs. This machine, a 4-A Universal Heavy Duty Saddle Type Turret Lathe, has a bed six feet longer than standard in order to turn the "king size" rear axle housings used in the giant roadbuilding machinery. And tolerances of .001" are held on these large pieces.

When you buy a Warner & Swasey—whether it's to handle the 5%" bar capacity work of the No. 1 E-C, or jobs requiring the 12" bar capacity of the big 4-A—you buy a machine with an industry-wide reputation for ruggedness and extreme precision. It's a machine you can count on for high productivity, low upkeep, ease of operation, and dependability in holding its built-in accuracy for many years ahead.

So whenever you have a turning problem, call in your nearest Warner & Swasey Field Representative. He'll work with you and recommend the right machine for your range of work.



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NOW GRAPH-MO® TOOL STEEL IN HOLLOW BAR FORM

New "Graph-Mo Hollow-Bar" combines the faster machining and longer wear of Graph-Mo with the economy of a hollow bar section

ADVANTAGES OF GRAPH-MO

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Most stable tool steel ever made Outwears others 3 to 1 Machines 30% faster Minimum tendency to pick up, scuff or gall Uniform response to heat treatment

ADVANTAGES OF HOLLOW BARS

No drilling
Finish boring is first step
Less machining time
Less scrap loss

More parts per ton of steel

ADVANTAGES OF

"GRAPH-MO HOLLOW-BAR"

THE Timken Company announces a new product—"Graph-Mo" Hollow-Bar"! It gives you all the advantages of Graph-Mo tool steel, plus the advantages of a hollow bar section.

PLUS

If you make ring-shaped tool steel parts you can eliminate drilling, make finish boring your first production step. You save machining time, save steel! The hole is already there!

And you get all the proven advantages of Graph-Mo— a special tool steel that contains free graphite and diamond-hard carbides in its structure.

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It's the most stable tool steel made! A 12-year stability test of a typical Graph-Mo steel master plug gage showed

less than 10 millionths of an inch change in dimension.

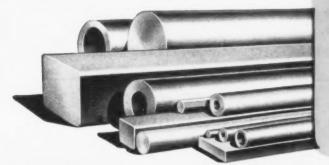
Graph-Mo has minimum tendency to scuff, pick up or gall. And it gives uniform response to heat treatment.

Add it all up and you've got "Graph-Mo Hollow-Bar" the big news of the year for makers of ring gages, dies and other annular tool steel parts.

"Graph-Mo Hollow-Bar" is available in sizes ranging from 4" to 16" O.D. with a variety of wall thicknesses. Distributed through A. Milne and Company and Peninsular Steel Company, it's available in the following cities: New York, Boston, New Britain, Philadelphia, Buffalo, Pittsburgh, Cleveland, Akron, Dayton, Toledo, Detroit, Grand Rapids, Indianapolis, Chicago and San Francisco.

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• This new Seco Slitting Line is fast, accurate and dependable. It quickly pays for itself with minimum use. Relatively low cost has been achieved through economy of design, without sacrificing rugged durability. This Seco Slitting Line is built to the same high-precision standards of heavy-duty mill type equipment.

The slitter is pull through type . . . available in sizes from 12" to 36" wide. The 30" line illustrated above easily handles 6 to 8 cuts of .062 stock at 150 to 375 f.p.m. line speeds. Electrical equipment is A.C. driven, constant speed. Payoff and Tension Reels handle up to 10,000 pound coils.

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TWO STATION fixture permits loading one station while four other tubes are being heated, so that duty cycle of almost 100 percent is maintained. Reject rate is low; scaling is minimized. Cost of operating induction heater is about \$0.90 per hour. You can get an idea of cost in your plant by adding your burden and rate for unskilled labor.

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- Send Induction Heater Booklet 1586430A
- Send print of 16 mm color-sound film "Induction Heating, Industry's Modern Tool."

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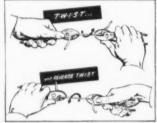


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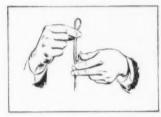
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TEST NO. 1. Chase wire is twisted ten times in each direction to reveal seams, slivers, as well as other irregularities.



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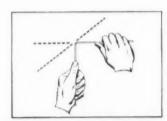


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TEST NO. 3. Chase wire is bent sharply at right angles in four different directions to reveal possible brittle condition.



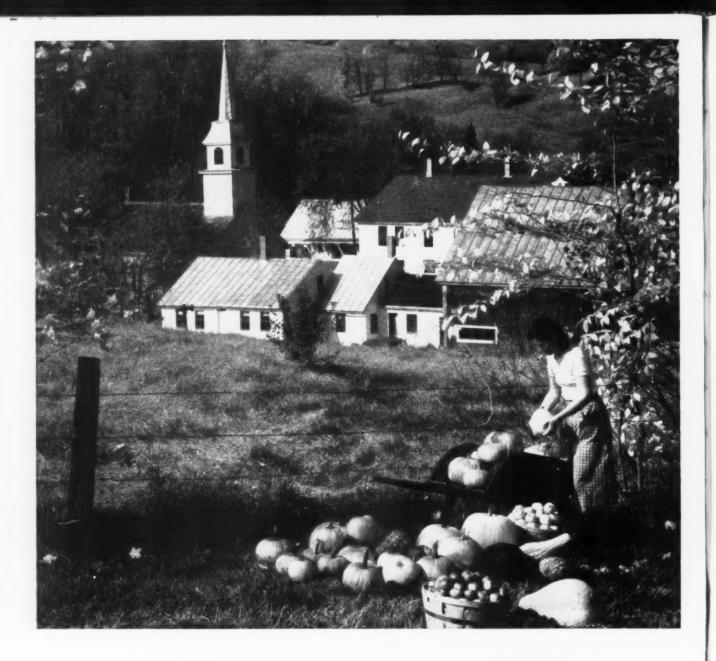
- √ Capability of over 50 cycles per minute.
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- Camless Hydraulic Feed to Double Tool Slides.
- Ample power to use either Roller Cutters or Carbide Cutoff Blades to full capacity.

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Thanks, too-For the unseen blessings

Traditionally, our American Thanksgiving marks the end of another harvest time ... a day for feasting, for giving thanks for the fruitfulness of the wonderful land in which we live.

But still more precious than the earth's bounty are those inalienable gifts of citizenship—the right to choose our way of life, our work, our way of worship. Today,

as never before, these freedoms that belong to every American stand forth as shining cause for heartfelt gratitude.

So again we pause to express our thankfulness for our friends and country. And in these troubled times we are especially grateful for the spiritual and material strength which has preserved our rights throughout the past and will defend them in the future.

RYERSON STEEL

CARBON, STAINLESS AND ALLOY STEELS-IN STOCK FOR IMMEDIATE SHIPMENT

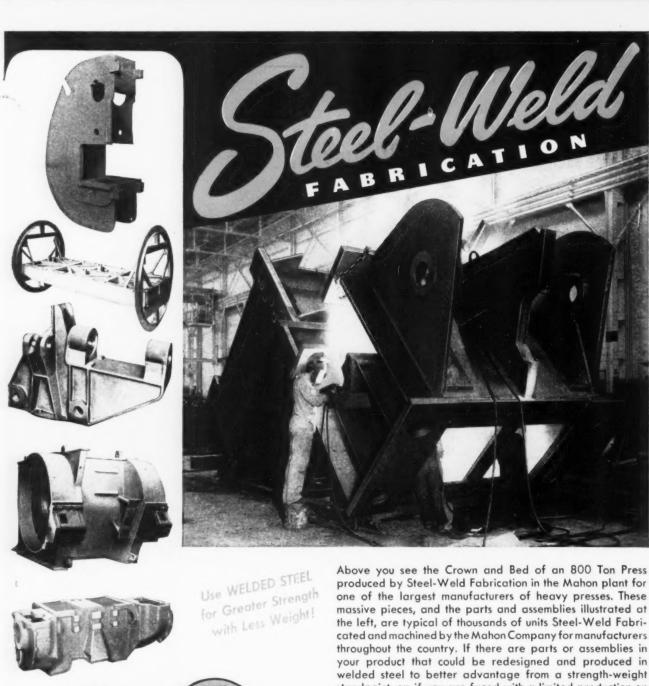
JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK . BOSTON . PHILADELPHIA . CINCINNATI . CLEVELAND . DETROIT PITTSBURGH . BUFFALO . CHICAGO . MILWAUKEE . ST. LOUIS . LOS ANGELES . SAN FRANCISCO . SPOKANE . SEATTLE

THE IRON AGE Newsfront

- NEW TREND IN INDUCTION HEATING may see wider use of 60 cycle units to bring parts to 1100° or 1200° F, followed by transfer to 10,000 to 12,000 cycle units to heat them to, say, 2100° to 2300° F.
- MOLYBDENUM CRUCIBLES FOR CERAMIC RESEARCH have been made by coating shaped cloth and flat tile surfaces with a molybdenum starch suspension, drying, and firing at 2000° C. Surface grinding with silicon carbide produced a bright metallic polish, prevented leakage of molten ceramics at high temperature.
- EXPANSION COSTS OUTSTRIP ORIGINAL ESTIMATES. A big steel expansion program nearing completion in the Midwest is costing 50 pct more than originally estimated. In the quarter just ended Bethlehem Steel authorized an additional \$25 million to cover spiraling cost of already-authorized construction.
- EMERGENCY TOOLING by auto companies unable to get deliveries on tooling orders for 1953 cars reached major figures. One company built more than 50 major machines—one at a cost of \$750,000.
- SERIOUS PRESSURE ON DIE BLOCK SUPPLIERS has resulted from defense forging of highly alloyed steels. Atop new die block requirements are high breakage and damage of dies in use.
- WASTE IN MILITARY BUYING caused by rush to get into production after Korea is being reduced because time now allows introduction of business practices. Military Sea Transport Service is an example: On mileage basis its '52 costs will be half of last year's. Army has cut printing bills by 45 pct.
- INTEREST IN PLASTIC DIES is growing in the auto industry. At least one motor car producer will turn out most of the major stampings of its new sports car on plastic dies.
- EFFECT ON ECONOMY OF GOVERNMENT BUYING of hard goods will be about the same for next fiscal year starting July 1 as it is now.

 Annual expenditures will remain in neighborhood of \$27 to \$28 billion. This assumes no change in international situation, no sharp price increases. Truce in Korea should have no effect on this projection.
- STEEL FOR SMALL CONSUMERS should ease by third quarter 1953, NPA says. With balanced inventories expected by second quarter, small consumers should get up to 30 pct more. NPA will review individual hardship cases before that time.
- HIGH RESISTANCE TO STRESS-CORROSION failure is reported for a new copper-nickel-silicon alloy. Addition of small amounts of iron gained the improved properties. Highest mechanical properties are developed by successive solution and aging heat treatment.
- IMPROVED METALLURGICAL PROPERTIES are reported through fast heating with radiant gas to above the critical temperature. The method has replaced salt bath annealing in one shop.

E



Above you see the Crown and Bed of an 800 Ton Press produced by Steel-Weld Fabrication in the Mahon plant for one of the largest manufacturers of heavy presses. These massive pieces, and the parts and assemblies illustrated at the left, are typical of thousands of units Steel-Weld Fabricated and machined by the Mahon Company for manufacturers throughout the country. If there are parts or assemblies in your product that could be redesigned and produced in welded steel to better advantage from a strength-weight standpoint, or, if you are faced with a limited production on an item involving heavy pieces in which pattern costs are a consideration, you can turn to Mahon with confidence. You will find in the Mahon organization a unique source with complete, modern fabricating, machining and handling equipment to meet your requirements . . . a source where skillful designing and advanced fabricating technique are supplemented by craftsmanship which assures you a smoother, finer appearing job, embodying every advantage of Steel-Weld Fabrication. See Mahon's Insert in Sweet's Product Design File, or have a Mahon Sales Engineer call on you at your convenience.

THE R. C. MAHON COMPANY DETROIT 34, MICHIGAN

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LABOR: Business Will Now Get a Square Shake

Management wants only impartiality from new Administration . . . Unions did not deliver the vote . . . Labor may try to show its power . . . No union crackdown—By Tom Campbell.

The big and small industrialist has had his fill of labor troubles. How does he look at the election returns? How does a labor leader look at them? Will there be more or less trouble in 1953? What should a businessman look for when contracts come up again?

These are a few questions coming up after the people have said they wanted a change; after labor leaders found out once again that they cannot "deliver the labor vote."

No Labor Coddling — Management does not expect miracles. It only wants a square shake. It wants impartiality and fairness. It wants an end to government interference and the championing of labor as a special pet. It will get all this. The executive can plan on it.

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But no plant manager should expect that labor will drop its fight to hold its gains and its power. It will fight even harder now that it hasn't a White House man to backstop it, right or wrong. That fighting will be done with the knowledge that real collective bargaining must and will come into its own for the first time in years.

The industrialist must expect for the next 6 months, at least, a testing—or flexing—of his muscles against those of labor. Both will take each other's measure with a healthy regard for the dangers involved.

Can't Deliver Vote—Labor leaders knew that sooner or later the honeymoon would be over. They are not too much surprised. They knew and still know that they cannot and never could "deliver" a labor vote.

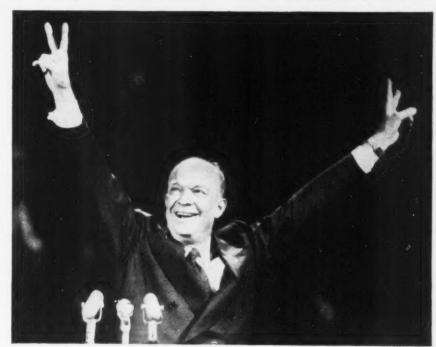
But they know something that many business people might over-look. Many persons might think that because many union members voted for General Eisenhower they will stay on that pitch. Not so. They along with other millions wanted a change in the White House *more* than they wanted to exhibit any blind loyalty to the union.

Now that workers have successfully joined with others to get a change they will go right back to

Bill? A check of business and government people who ought to know suggests that there won't be many, if any, changes soon.

Management will lean over backwards to make sure that it is not accused of "turning the clock back" because of the Republican victory. General Eisenhower has made it plain he is for labor within impartial and fair bounds. He is not committed to any crackdown—for the sake of a crackdown—on labor.

What about strikes? There may be many smaller ones and some big ones as other unions attempt to "catch up" with steel and coal. After that there should be a slowdown in the number of shutdowns.



IKE: The President-elect has made "no deals," can be impartial.

their union loyalties. Whatever they can do to further their own interests they will do exactly as before. Any attempt to tie the union worker's vote to what he believes he should have as a worker would be a costly mistake.

Taft-Hartley? — Will there be many changes to the Taft-Hartley

Less Wind in Sails—There will be plenty of growling, threats and showing of strength but the wind is out of labor's sails as far as calling major strikes which are contrary to the public interest. Management knows this; so does labor. That applies to the steel contract to come up again next summer. It looks as if there will

MURRAY: The Union—His Monument

Steel union came to ascendancy with the late Philip Murray at helm... He had just begun new era of trust with steel... McDonald USW head, Haywood for CIO?—By Tom Campbell.

Before Philip Murray died early this week he had brought the United Steel Workers of America a long way towards maturity. The 15-year militant and often rough drive of Mr. Murray's brought the steelworker to new heights in wages, fringe benefits and economic power.

He died at the start of a new phase of industry-labor relations.

A short time ago Mr. Murray and Benjamin Fairless, U. S. Steel head, meeting alone at the White House, sealed a personal bargain with a handshake. That bargain augured good will for the steel industry. The method is known as the grass roots approach.

Grass Roots—Both men and presumably other steel leaders were going to start working for mutual trust at the local union level. There they hoped to dissipate early the bad relations which might later cause national strife. That movement has not ended with Mr. Murray's death. It has just begun. There may be in the beginning some fits and jerks on both sides but it is in the cards that steel management and the USWA are entering a new climate of understanding.

The steelworkers' union is today big business. When Mr. Murray started his organizing campaign in 1937 he had less than 5000 members as a core. Last week there were close to 1.2 million members.

Pick McDonald?—Mr. Murray's successor in the USWA is expected to be David J. McDonald, secretary-

the new phase in labor relations which Mr. Murray had intended to start rolling. No change in that plan is to be expected. Future union aims in industry relations will include: holding what it has gained; and entering into a closer cooperation with the steel industry and its problems.

Little mentioned but important in the steel union's ascendancy is Vincent Sweeney, public relations director of USWA. Many union policies, both internal and public,



HANDSHAKE: These always men two trusted and respected each other. Left to right are the late Philip Murray, who died of a heart attack this week, and Benjamin Fairless, of S. Steel Corp. Both had planned a new phase in laborindustry relations, starting with grass roots meetings and working up to mutual understanding. This work will not stop. About Mr. Murray's death, Mr. Fairless said, "the country had lost a great citizen as well as a great labor leader."

treasurer of USWA. He was Mr. Murray's personal choice. Mr. Mc-Donald has been active in the steel union from its inception. He was Mr. Murray's private aide when Mr. Murray was vice-president of the United Mine Workers.

Mr. McDonald is well aware of

had the benefit of his experience. It is expected that his counsel will be sought and used in the new lineup of command.

The Legal Dept.—Arthur J. Goldberg, general counsel for the USWA, is expected to remain in the spot in which he was a close advisor to Mr. Murray on Washington and legal matters.

While the steel union is but one segment of the CIO it is one of the most influential.

Its support of Allan S. Haywood, CIO vice-president, as Mr. Murray's successor to the presidency of the CIO far outweighs its feelings for Walter Reuther, United Auto Workers' head.

It is likely that Mr. Haywood will succeed Mr. Murray in the CIO.

Special Report-

Continued

be no shutdown in steel in 1953. The trend points to a management which will insist that their top men have their feet under the bargaining table. Men with worker experience and bargaining ability—but with the soft voice and the fair outlook—will get the farthest with organized labor in 1953.

Labor people who see the handwriting on the wall will pull their punches just in time to prevent a loss of what they have gained. The result should be a testing of strength, a better understanding of each other, followed later by a big step forward—all because the people have spoken.

STEEL: Bright Outlook for Stainless

Order books filled through fourth quarter, shaping up for first... Consumers decry lack of nickel... Some learning to work with chrome may not switch back—By J. B. Delaney.

These are happy days for stainless steel producers. Business is good. Order books are filled through fourth quarter and shaping up well for first quarter of 1953. Outlook for the next year is optimistic.

From a long-range view the stainless steel producers see an ever-expanding market for their wares. They can point to an upward trend dating from the days when the industry devoted a large part of its efforts to persuading hesitant fabricators to give this newcomer to the steel product line a trial.

One large potential market for stainless is in curtain-wall building construction. The industry looks upon this application as one in its infancy, with plenty of room to grow as the metal's advantages are proven. Then there are such old standbys as the dairy, chemical, power, oil, beer, and food processing industries. These fields are expected to provide a good, continuing demand for stainless.

Many Applications — There are many applications for stainless in the defense program. Atomic energy plants consume heavy tonnages of plate, tubular goods and other products. Capital goods expansion is reflected in brisk sales of stainless.

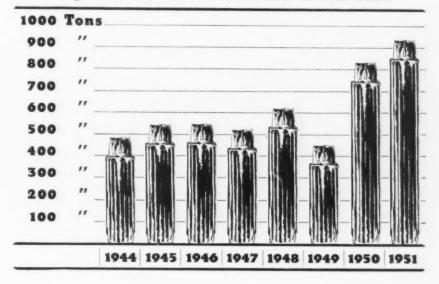
Principal civilian prop for the industry is automotive. The car producers are chewing up impressive tonnages, particularly strip, for car trim. The continued strength of this market will depend on success of the automotive industry in obtaining allotments of other steel products to maintain high production levels.

The one sour note in the picture is soft demand from producers of other consumer durables. The industry is divided on whether this reflects buying patterns of ultimate consumers or whether some fabricators are limiting purchases in the hope that government restrictions on use of nickel will be lifted, making more nickel-chrome stainless available.

Nickel Trouble—It is no secret that some fabricators are griping about the scarcity of the nickelwith it because it reduces his costs. Where a difference of say \$50 per ton is involved, the large consumer will think twice about returning to nickel-chrome. The smaller fabricators probably will revert to nickel-chrome as quickly as they can because costs would not be so much of a factor.

Demand by Products — Generally, order books of the larger producers are shaping up like this: Sheets, strip, and plates completely sold through end of year and, in some instances, through January. One company is sold through February on strip. First quarter is fill-

STAINLESS STEEL Ingot Production in Thousands of Net Tons



chrome grades, which they find more satisfactory than the straight chrome steels. Nevertheless they are getting by with the straight chrome, and it is questionable whether this would influence purchases.

Another argument making the rounds in the industry is whether fabricators who have used straight chrome by necessity will return to the nickel-chrome grades if and when nickel becomes more plentiful. There is no clear-cut answer to this. Consensus is that, all other factors being equal, the large fabricator who has learned to work with straight chrome will stick

ing up fast on plates. Bars are sold midway through first quarter by at least one mill. Tubing is extended into second quarter. Wire demand, bolstered by heavy use of welding rod, also is strong.

Part of this demand is make-up for strike losses. Some producers were a bit worried at strike's end because consumers apparently were in no rush to place new orders. But this was largely due to the existence of orders on producers' books before the strike started. Consumers saw no reason to place new business until old orders were filled.

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RECORDS: Go Underground for Safety

U. S. Steel stores valuable paperwork in worked-out coal mine... Will be safe even against direct hit... Location secret... Air conditioned to protect records, personnel.

U. S. Steel Corp.'s newest "Operation Underground" is a workedout coal mine in western Pennsylvania. They call it "Mine X" because the exact location is a closely-guarded secret.

It is the steel company's answer to the threat of atomic warfare. To this pit 200 feet underground company records of all kinds have been funneled for more than a year. These records, all of them vital, will be safe from even a direct bomb hit.

"Mine X" is the brain child of Enders M. Voorhees, chairman of U. S. Steel's finance committee, who felt measures should be taken to safeguard irreplaceable papers.

The mine is reachable by two portals—one suitable for pedestrian and automotive traffic; the other serving a narrow gage railroad, which also is used in parts of the pit still producing coal.

Air Conditioning—To overcome temperature and humidity disad-

vantages, the storage area is heated to 70°F, and electric devices reduce relative humidity to 60 pct. In all, 75 acres have been bought for storage purposes although to date two storage rooms now in use total only 16,000 sq. ft.

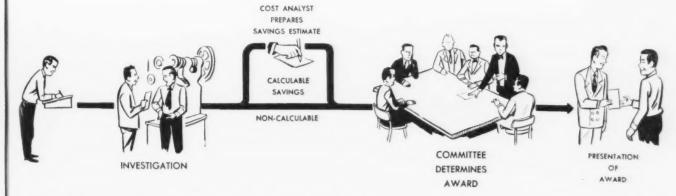
4300 cartons of records have been processed and stored here.

In an average day ten rolls of microfilm records and 254 envelopes of business papers are received for cataloging and filing. More than 6000 rolls of microfilm records have been filed so far as well as some 38,000 cartons of records from World War II experience, and over 5000 cartons of long-term corporate records.

Additional shelving space for 63,000 cartons of records has been provided. It is estimated that well over 100 million records can be stored in the main record room.

IN STORAGE: Part of the 16,000 sq ft of records now stored in U. S. Steel's underground vault. Over 75 acres have been bought, which will be developed as needed. Additional shelving space for 63,000 cartons has already been provided.





SUGGESTIONS: Pay-Off in Millions

Idea of employee submitting suggestions for production savings, safety solidly accepted by industry . . . How plans operate at GM and Ford . . . Benefits are real—By R. D. Raddant.

There's an old gag about the boss opening the office suggestion box and finding this bit of advice: "Drop Dead." Few management ideas have borne the brunt of more jokes than has the suggestion box.

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Once, these gags may have stemmed from fact. But the truth now is that few industrial relations plans have accomplished as much or carry more respect of employer and employee alike than a well-managed suggestion plan.

Outstanding examples of successful suggestion plans are working at General Motors and Ford. In these two automotive industries suggestion plans are big things.

Millions of dollars have been distributed in payments for adopted suggestions. In return, the companies have achieved other millions counted in production savings, improved safety and working conditions, and incalculable returns in stimulating job interest and industrial good will.

Millions for Ideas—Of the two biggest automotive plans, GM's is the older, starting corporation-wide in March, 1942. Some GM divisions have had suggestion plans for 25 years. Through the first half of this year, 874,603 suggestions were submitted, 200,491 were adopted, and \$8,406,010 awarded.

Taking 1951 as a sample year,

awards totaled \$1,516,533. Of this, \$986,653 was paid for suggestions with measurable labor or material savings; \$331,623 for suggestions reducing accident hazard, improving housekeeping or working conditions; \$198,257 for special management awards outside of these categories.

In the 5 years the Ford plan has been in operation, \$1,236,305 has been paid out for 23,793 adopted suggestions. Awards for 5216 accepted suggestions have still to be added to the total. The 29,009 adopted suggestions came from 105,176 suggestions that merited study.

The Batting Average—Employee interest in the suggestion plan is indicated by Ford's participation last year which reached an average of 292 acceptable suggestions for every 1000 employees.

GM and Ford plans are basically similar. The most obvious difference is in the maximum award, \$2500 at GM and \$1500 at Ford. Both have highly successful management suggestion plans where awards are recognition and commendation rather than financial.

Administrators of suggestion plans agree that one of the most important products is in stimulating employee interest in his job and establishing a more personalized liaison with management. Boiled down to the main points, a suggestion plan's merits can be evaluated in two types of benefits:
(1) What it means in cost savings and (2) what it means in improved conditions, industrial relations, morale, worker communication with management.

Of the two, it is difficult to determine which is the more valuable to the company. Administrators of plans feel that both are of equal importance.

Setting Award—Many outsiders have the idea that the size of the award is based on a vague idea of its worth or on someone's whim. Nothing could be farther from the truth.

At Ford a production suggestion is tested for savings under 2 months actual operation. The person submitting the suggestion receives an amount equal to 2 months savings up to the maximum. At GM the award winner receives one-sixth of the calculated annual savings up to the GM maximum.

Awards of a non-calculable nature such as safety and improved working conditions are determined on an evaluation of the suggestion's importance.

A number of GM divisions also have supervisory suggestion plans which set up a system for supervisors to submit ideas. No awards are paid as recognition is given through a letter of congratulation and inclusion of the ideas in the supervisor's personnel record.

Recognition—At Ford a parallel management proposal has been set up with supervisory personnel en-



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KINNEAR Rolling Doors prove their extra value for every need

The advantages of Kinnear Rolling Doors for all types of buildings are proved by their performance in big installations like this—where doors are the very life-line of efficiency.

The coiling upward action of Kinnear Rolling Doors makes all floor and wall space around doorways fully usable at all times. Freight or materials can be stacked close to the door curtain, *inside and outside the building*, without blocking door action.

Opening completely out of the way above the lintel, the doors stay out of reach of damage by wind or vehicles. The interlocking steel-slat construction — originated by Kinnear — provides a rugged, all-

metal curtain that assures long service and low maintenance, plus extra protection against fire, theft, and the elements.

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ROLLING DOORS

The KINNEAR Mfg. Co.

FACTORIES:

1760-80 Fields Avenue, Columbus 16, Ohio 1742 Yosemite Ave., San Francisco 24, Calif. Offices And Agents In All Principal Cities couraged to submit ideas and suggestions which must, however, be outside or above the regular scope of their position.

In this plan a successful suggestion that applies to a supervisor's plant results in a letter of recognition from his superior. If it can be carried out elsewhere, it results in a letter from the plant manager. If it can be carried into other divisions, it is officially recognized by the vice-president in charge of manufacturing. It helps in promotions.

Administrators of plans agree that the success or failure of the plan rests in the fairness of its administration and the attitude of top management.

"You can ruin a suggestion plan in one minute, if you don't look into the mirror constantly," declares R. E. Roberts, manager of employee relations at the Ford company.

"The success of a plan as evaluated in the attitude of employees directly reflects the attitude of top management," is the observation of D. G. Morse, director of suggestion plan, employee relations staff, of GM.

It should be noted that the GM plan was introduced under the administration of C, E. Wilson, and at Ford under Henry Ford II, both considered among the leaders in industry in developing good labor relations.

Warehousemen Form Contract Pool

d

Warehousemen in the Chicago area have formed the second storage pool for handling government contracts with organization of the Defense Warehousemen's Assn. of Chicago.

Purpose of the association is to set up a plan by which members can split up a big government storage contract, each member being pro-rated a share of the required storage space on the basis of facilities.

Approved by Defense Dept. and Defense Production Administration, a similar association was formed earlier at Philadelphia. Another is planned for the Port of New York. be

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SOUTH: Gaining Mighty Industries

Terrific expansion spreads over the land of Dixie . . . Area is expanding industry faster than anywhere else . . . Health and living standards climbing rapidly—By W. V. Packard.

Industry is growing faster in the South than in any other part of the country. Living standards are rising fastest there, too. This may come as a surprise to some, but it is nonetheless a fact.

From 1929 to 1951 southern manufacturing rose 470 pct — from a little over \$2 billion to over \$12 billion.

World War II gave sharp impetus to industry in this area, as elsewhere in the country. And by far the greatest expansion has come since then. (Consumption of steel has doubled since 1940.) But perhaps the most amazing fact of all is that the sharpest rise in southern industry has come since the end of the war. The trend lines are headed sharply up, and still going.

The Reasons — The South is proud of its new found industrial might. Some states are trying to hasten the process and encourage building of new factories by offering tax exemptions for as long as 10 years. At least two states have authorized local villages and communities to raise funds for plant development, backed by their own taxing power.

There are also wage differentials between southern and northern states

But these temporary inducements do not explain the rising tide of industry there. The explanation lies in materials, markets, and manpower. The South has all these in abundance—plus a number of excellent ports, which in many respects are more modern than those in the North and West. Rising rail freight rates are a factor, too.

As for the wage differentials—they are fast diminishing, will soon disappear completely in a number of industries. The latest wage agreement in the steel industry, for example, slashed the differential in

half (from 10e an hr to 5e an hr).

Helping provide suitable location and plant for a new industry may influence the choice of one community over another, but industrial boosters doubt that it has had much effect on overall area expansion. As one local banker put it, "There's plants in Kentucky, Tennessee, and South Carolina.

All this is having a terrific impact on health, and living standards—and on agriculture, too. Industrialization of the towns is speeding mechanization of the farms. Sharply rising wages are pulling workers from the farms to the factories. On the farms the departing workers are being replaced with machinery.

New equipment and better farming methods have helped raise agricultural output in the South over 100 pct in the past 20 years. The

MORE NEEDED : Booming industry in the South and South west provides a ready market for steel from this Sheffield Steal Corp. openhearth. Eight such furnaces and one electric have raised Sheffield's capacity to about a million tons. Plant is conveniently located on Houston Ship Channel.



got to be sound economic reason for a company to locate here, or all the inducements in the world won't make any difference." "If the business prospects are good, the money will show up."

Growth Industries — Biggest boost of all has come from expansion of basic industries such as chemicals, petroleum, aluminum, gas, steel, synthetic rubber, machinery, paper, and synthetic fibers.

Nearly 30 pct of all certificates of necessity have gone for expansion of southern industry. The total is well over \$4 billion. The government is putting several additional billions into atomic energy increase is sharpest now.

More Steel Needed — Living standards, which had long lagged the nation, are zooming at a dizzy pace. Recent Dept. of Commerce figures show southerners buying 333 pct more lumber, building materials, and hardware; 268 pct more home furnishings and appliances; 394 pct more food; 265 pct more clothing; 303 pct more automotive goods than during 1929.

Though steel consumption in the South has doubled in little more than 10 years, only half of it is made there. Per capita consumption, though still well below the national average, is rising rapidly.

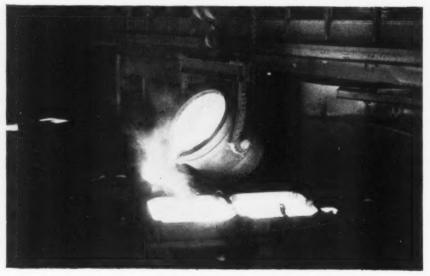
FERROALLOYS: Market Shifting

Supply at least adequate on most alloys ... Salesmen are now beginning to look for customers ... Demand staying high for all ... Columbium, tantalum getting freer—By R. L. Hatschek.

Ferroalloy producers are beginning to think about how to keep all their furnaces busy instead of worrying every extra pound out of each. The picture is changing—brightening for most consumers. Suppliers indicate that availabil-

year reduced demands considerably.

Production of military goods always puts an added emphasis on the alloy steels. In today's jet warfare even heavier production of high-temperature resistant steels



POURING: A melt at Electro Metallurgical Co.'s half completed Marietta, Ohio, plant.

ity is adequate to good on all alloys but a few.

Low carbon ferrochrome and low carbon ferromanganese are a bit on the tight side yet. Ferrotungsten is still being allocated but tungsten powder is off the rationing list.

Washington has been extremely strict in its allotments of ferrocolumbium and ferrotantalum and the result is a fairly good supply today. These two are still being doled out by the government but the quantities are getting a bit more generous.

Need Plenty—But don't get the idea that sales are off. Quite the contrary producers report demand for all ferroalloys is at an all-time peak. With steel production breaking records almost every week this is to be expected even though the strike earlier in the

is required. Ferrochrome use has jumped particularly as a result of this trend even though it is being held back to some extent by the shortage of nickel, with which it is frequently used.

Optimism has been voiced in some circles on this point as a result of promising developments in the substitution of manganese for all or part of the nickel in chrome-nickel stainless steels. Possible substitution of these steels, which have 18 pct chromium, perhaps 4 or 5 pct manganese and 4 or 5 pct nickel for the 18-8 types, would go a long way in easing nickel.

Expansion—But growth in the ferroalloy industry is not being led by growth in the steel industry. On a percentage basis, the ferroalloy producers are boosting their output even faster than steel.

Since the start of war in Korea

production has been increased by 30 to 40 pct and facilities now under construction will boost the industry's capacity to more than 50 pct over pre-Korea levels. This expansion should be completed by the end of the coming year.

Greatest emphasis is being placed on ferrochrome, ferromanganese and ferrosilicon in this expansion. A new goal of 1.5 million tons cacapacity by 1954 has been set for the blast furnace ferroalloys, ferromanganese, silicomanganese, spiegeleisen (20 pct Mn) and silvery pig iron (up to 17 pct Si from blast furnaces). Capacity at the beginning of 1951 stood at 1.1 million tons for these alloys and represented about half of the ferroalloy industry.

REFRACTORIES:

Planned expansion of facilities of four types now held enough.

Defense Production Administration last week said that enough expansion of facilities is in sight for four types of refractories to meet foreseeable needs.

Types and goals for which sufficient applications for certificates of necessity and tax amortization have been received are:

Pouring refractories need has been set at 76 million 9-in. equivalent by Jan. 1, 1954. This is an increase of 23 million above 1950.

A capacity of 431 million 9-in. equivalent is sought for silica refractories by the same target date. This is a boost of 117 million above 1950

An expansion goal of 64 million 9-in. equivalent ladle brick has been established. This would increase the capacity from 205 million as of 1950 to a new potential output of 269 million annually.

Goal for fire clay, super duty and high alumina brick has been set at 782 million 9-in. equivalent by 1954. This means a boost of 139 million in capacity from 1950.

Expansion goals previously established in September were for a total of 140 million 9-in. equivalent for basic refractories and 56 million 9-in. equivalent for insulating fire brick.

REFRACTORIES: Buoyed by Steel Rate

Record steel production expected in 1953 lends optimism to refractory producers . . . Recent purchasing sprees have caused drop in demand . . . Comeback expected—By R. M. Lorz.

The expanding steel industry is a solid market for refractories to line new openhearth and blast furnaces. But steel expansion must inevitably reach a slow-down period, then an end.

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This certainty and a somewhat depressed market is giving some refractory producers the fourth quarter jitters, but the "feel" of the future market indicates strength rather than weakness, they say.

Record Rate—A good deal of this optimism is based on a continued high steelmaking rate. Consumer inventories are generally high, but the steel industry will barge into 1953 operating at a record rate. This will work the fat off stockpiles. And it will be an expanded steel industry that will be consuming more refractories. One good thing about expansion, producers say, it always enlarges the market.

Some refractory firms report their market has leveled off. Handicaps against the current market are two purchasing sprees in the past few months. One came after the steel strike. The other was triggered by the threat of a refractory strike last September. In both cases consumers rushed to load up on inventory.

Some sources estimate that in the first 9 months of this year the market for refractories skidded about 20 pct. And some firms say they have been reaching into backlogs at a rate of from 7 to 8 pct each month.

Depressed — Generally, refractory producers will admit somewhat depressed market conditions. But they point that sales will right themselves. Some optimists point out that renewal orders will turn over more rapidly because of steel's greater consumption. An-

other factor is that other industries using refractories have been on the expansion bandwagon.

Specialty producers are particularly hopeful in the face of continuing demand from cement, lime, glass, ceramics and oil industries. The sales manager for one comidle facilities. Others not so optimistic point to refractories expansion of from 35 pct to 40 pct in the past 6-year period.

Brakes Applied — DPA began putting the brakes on the program just last spring when the steel strike was imminent. Before the slow-down on certification, write-offs for 1951-52 were impressive.

Rapid amortization totaling over \$40 million was granted to ten firms in 1951. This year, from Jan. 1 to Sept. 1 DPA has approved 67



COMING OUT: Refractory brick being pulled from tunnel kiln.

company told THE IRON AGE his men were working a 48-hr week to keep up with demand.

Firm Future—The picture is reported sound for byproduct coke oven and silica brick. Because of backlogs and the large number of special shapes required, these items will be in demand for some time. The head of one firm says his orders for coke oven refractories carry over into 1954. Some refractories people feel rapid coke oven expansion will keep the situation tight for the next 10 years.

Blast furnace and openhearth demand is good. There is some slowness in container and small specialty mill consumption.

What about over-expansion? Of course, there are always fears of over-expansion. But producers generally feel it will be at least 5 years before they are haunted by

certificates valued at \$25,401,000 on a proposed investment of \$31,-922,000 in clay refractories.

In the same period DPA approved 37 non-clay certificates worth \$41,880,000. That represents 79 pct of proposed investment.

Profits picture for the industry is also off color because of unbalanced wage-price structure. Refractories workers were given the same benefits steel workers received. But their employers complain OPS hasn't given adequate pass-through relief. The increase approved by OPS, which averages 5 pct, has sent the industry to the wailing wall. Specialty producers complain their labor costs are the highest in the industry.

One refractories executive summed up conditions in his industry by warning his employees that the time had come to "get out and sell."



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If your dealer cannot supply you, write for literature and samples. Dept. IA11





Those moves of material "up" - "down" - "in" - "out" -"across" and "back" can't be avoided - but their cost can be minimized.

It's largely a matter of proper selection of cranes, hoists, etc., as to type, construction, cost of operation, freedom from repairs, etc.

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equipment for several decades but we are regarded by our customers as material handling "consultants." We'll welcome an opportunity to discuss your problems. Doubtless there's a Euclid crane or hoist to handle the situation in an ideal manner.

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THE EUCLID CRANE & HOIST COMPANY

1361 CHARDON ROAD, EUCLID, OHIO

Construction^{*}

BUILDING: Dollar

New construction for first 10 months above '51 levels. Industry accounts for most.

Dollar volume of construction is running about 4 pct ahead of last year for the first 10 months of 1952-but when adjusted to allow for higher costs, the physical volume is about the same.

Figure for new construction through October was estimated at \$27 billion or about \$1 billion less than in 1951, according to Bureau of Labor Statistics.

Expansion of industrial facilities, public utilities, and publicly financed construction including military and highways accounted for most of the increase.

Lagging-On the other hand, construction of commercial enterprises such as stores, warehouses, lofts, and residential construction was lagging behind last year's figures.

Construction work continued at the \$3 billion-a-month level during October, the government reports. Should weather remain open for a substantial portion of the 2 remaining months of 1952, indications are that final dollar totals will exceed those of 1951.

Public financing of construction projects exceeds last year's by about 16 pct. But dollar volume is substantially less than private construction - about \$9 billion against \$18 billion.

Steel Inquiries and Awards

Fabricated steel awards this week include the following:

2400 Tons, Congress St. super highway section 3F. 14, Cook County, Ill., to American Bridge.

1365 Tons, Chicago, Halsted St., Bascule Bridge to American Bridge.

1000 Tons, Bloomington, Ind., RCA Mfg. Bldg., to Mississippi Valley Structural Steel.

Fabricated steel inquiries this week include the following:

4341 Tons, Portland and South Portland, Me., Fore River Bridge. (Includes structural carbon and silicon steel.)

Reinforcing bar inquiries this week in-clude the following:

1103 Tons, Portland and South Portland, Me., construction of Fore River Bridge. Completion date Sept. 1,

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shipments of fabricated September structural steel, as compiled from reports received by the American Institute of Steel Construction, amounted to 226,458 tons, practically the same as the previous month and 4% greater than the average monthly rate of 216,778 tons. The total shipments for the first nine months of 1952 were 1,950,999 tons.

Bookings during September were 204,754 tons, a drop from the previous month but some 9% greater than the corresponding month during 1951. Bookings for the first nine months of 1952 totaled 1,936,804 tons.

The backlog of work ahead as of September 30 stands at 2,342,374 tons.

A tabulation showing the detailed figures for the nine months is given below:

Estimated Total Tonnage for the entire industry

	the	entire mai	ustry
CONTRACT	S 1952	1951	Avg. 1947-1950
Total Ton		1.001	1011-1000
January February March April May June July August	213,110 230,832 226,394 209,106 209,888 167,492 221,559* 253,669*	361,373 256,746 297,517 337,026 268,166 207,966 222,540 212,730	161,976 152,186 221,387 177,825 176,266 196,725 229,334 212,899
September		188,187	215,870
Totals	1,936,804	2,352,251	1,744,468
SHIPMENT	S		
January February March April May June July August September	244,947 246,398 268,840 230,670 244,222 125,486 138,267* 225,711* 226,458	214,000 193,638 237,087 234,095 234,486 257,066 204,380 236,915 228,296	166,910 161,170 191,297 192,861 198,426 192,851 183,329 204,948 197,331
Totals	1.950,999	2,039,963	1,689,123

TONNAGE OF BACKLOG 2,342,374 2,580,345 1,321,835 Percentage scheduled for production within the next four months (To January 31) 44% 12% 55%

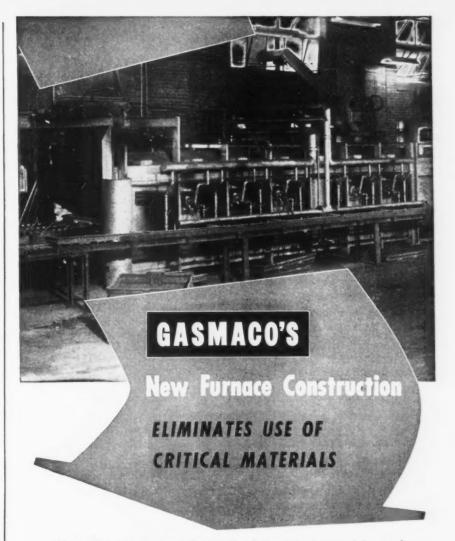
Percentage scheduled for production after the next four mouths

(From February 1) 56% 3400

· Revised



"But we can't move to larger quarters . isn't a machine in the plant that would stand moving."



Desirable savings in nickel and other critical materials can be accomplished through new methods in design and construction of industrial furnaces by The Gas Machinery Company.

Specifications for forging and heat treating can be met by employment of a rotary furnace, the construction of which requires only refractory and moderate quantities of carbon steel. Rotary furnaces require less investment for the same duty, and results are superior.

Other Gasmaco accomplishments include the use of silicon carbide in roller hearth furnaces, replacing alloy steel. For practically all applications where alloy steel tubes and rollers were formerly used, silicon carbide can be substituted, with greater benefit.

Our furnace engineers will be glad to point out the many advantages of Gasmaco developments and industrial heat applications which may fit your requirements.

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Gas Plant Equipment and Industrial Furnaces THE GAS MACHINERY CO. (Canada), Ltd. HAMILTON, ONTARIO

RAILROADS: Rate Boosts Aid Earnings

Increased revenues, lower costs improve Class I roads' financial picture... Nine months' income of \$502 million raises return rate on investment to 4.25 pct—By A. K. Rannells.

Revenues are up, operating costs are down — resulting in higher net income, more dividends, and an improved position for acquiring badly needed new and additional equipment.

This seems to be the story of rail transportation so far this year following a series of freight rate increases allowed the roads by Interstate Commerce Commission, the most recent being approved last April.

According to reports filed by 131 Class I railroads, total operating revenues for the first 9 months of 1952 amounted to nearly \$7.8 billion, up 1.7 pct. Operating expenses were less than \$6 billion, down 0.5 pct.

Earnings—Net income through September was estimated at \$502 million — as against \$391 million last year. Figuring it for the previous 12-month period, the railroads are now averaging a 4.25 pct rate of return on their investment. Previous 12-month rate was 3.78 pct. Dividends to stockholders have increased \$5 million this year.

Improved efficiency has lowered roads' operating costs in the face of rising costs for labor and materials they buy. Improvements instituted after the war are now paying dividends. Foremost in slicing operating costs is the diesel engine which is proving more economical and more efficient than the old steam locomotive type. Virtually all new orders for locomotives specify diesel engines.

It is the official position of the railroad industry that a return of 6 pct is the minimum required to keep it on a sound and prosperous basis. The industry feels it would then be able to carry out any necessary expansion, replacement, improvement and maintenance programs.

While the present return is still 1.75 pct short of the "essential minimum" wanted by the railroad industry, nevertheless it is in a better position to carry out programs already scheduled.

On Orders—These include the freight car program. Through the first three quarters of 1952, car deliveries totaled a little more than 33,000 units—57,000 short of requirements. This means a minimum of 177,000 units are needed over the next 15 month.

Locomotive deliveries have been somewhat better, despite materials shortages. Through September, nearly 1900 new units had been put into service, slightly more than for last year.

As of Oct. 1, the backlog of locomotive orders stood at 862 and the freight car backlog at 95,377, representing a commitment on the part of the railroads of not much short of \$1 billion.

Expansion — Several hundred million dollars are also to be expended over the next few months in more than 1000 projects looking to the expansion and improvement of related railroad facilities. These include:

Passenger and mailhandling facilities: Rail (and highway) including the big Union Station at New Orleans—59 projects to cost \$139 million.

Repair shops and related facilities: Primarily roundhouses and diesel repair facilities although including a number of machine shops and truck repair shops—193 projects at a cost of \$85 million.

Signal and communication systems: Includes both main lines and yards, substantial replacement —189 projects, costing \$80 million.

Yard change and expansion:

IRON & STEEL: September Output By Districts

As Reported to American Iron and Steel Institute

BLAST			PIG	IRON		FERRO-		TOTA	L	
-NET TONS	Number of Companies								Pct of	Capacity
DISTRICTS	Num	Annual Capacity	Sept.	Year to Date	Sept.	Year to Date	Sept.	Year to Date	Sept.	Year to Date
Eastern PittsYngstn. CleveDetroit Chicago Southern Western.	6 7 8	13,963,580 27,468,600 7,501,100 15,703,740 5,648,620 3,476,700	1,163,131 2,244,665 655,135 1,239,474 508,723 284,737	8,146,753 15,668,921 4,410,038 8,736,728 3,439,781 2,092,719	26,818	196,915 167,039 47,782	1,193,415 2,271,483 655,135 1,239,474 520,121 284,737	8,343,668 15,835,960 4,410,038 8,736,728 3,487,563 2,092,719	104.2 101.0 106.7 96.4 112.5 100.0	79.7 77.0 78.5 74.3 82.5 80.4
Total	35	73,782,340	6,095,865	42,494,940	68,500	411,736	6,164,365	42,906,676	102.1	77.7

			(Incl.	TOTAL S Alloy Steel,		ngots)	ALLOY	STEEL	CARBON	INGOTS
STEEL -NET TONS	Number of Companies				Pct of	Capacity				
DISTRICTS	Num	Annual Capacity	Sept.	Year to Date	Sept.	Year to Date	Sept.	Year to Date	Sept.	Year to Date
Eastern PittsYngstn. CleveDetroit Chicago Southern Western	23 33 8 15 11 12	21,709,870 42,350,760 10,485,380 22,258,500 5,291,260 6,491,900	1,747,921 3,552,791 863,991 1,902,540 461,178 533,683	*12,501,088 24,972,408 6,323,356 13,286,327 3,131,773 4,005,545	98.3 102.5 100.7 104.4 106.5 100.4	76.9 78.8 80.6 79.7 79.1 82.4	148,503 519,837 93,271 156,098 6,776 6,972	1,007,717 3,573,963 492,858 1,017,900 48,705 82,958	375,494 455,333 89,280 267,773 2,290 36,254	2,603,776 2,962,43 650,82 2,008,92 12,78 *159,85
Total	80	108,587,670	9,062,104	*64,220,497	101.9	79.0	931,457	6,224,101	1,226,424	*8.398,59

^{*} Ravise 1.

Primarily additional trackage, some new construction—61 projects, costing \$51 million.

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Bridges: Mostly replacement, ranging from single spans to the New York Central's new Harlem River bridge—119 projects, costing \$43 million.

Freight handling: Largely construction of new and replacement of old freight stations with more space—23 projects at a cost of \$7 million.

Miscellaneous facilities: Includes 352 other projects ranging from tunnel work to power lines and installation of safety systems, at an estimated cost of nearly \$90 million.

Airline Seeks Working Capital

Trans-World Airlines, Inc., is seeking to increase its general working funds by offering an additional 381,916 shares of common stock to present stockholders.

An additional \$5 million in working capital is needed, Trans-World told the Securities & Exchange Commission, to pay expansion bills and buy new aircraft for its service.

Hughes Tool Co., which already owns about 75 pct of the outstanding common stock, has agreed to enough of the unsubscribed shares of the present offering to assure the airline company of the money needed.

Income Hits \$273 Billion Mark

Personal income in September, sparked by a \$2 billion increase in private industry wages, rose above the August rate to \$273 billion.

At the same time, the government reported that only about 2 pct of the nation's wage earners were not at work, unemployment figures standing at a postwar low of 1,438,000.

This meant that 61,862,000 persons were on payrolls other than the armed services.

End of the steel strike saw employment rise in durable goods factories as well as the automotive and machinery industries. Government employment remained stable during August.



Coated Abrasives Grind Fine

A surface grinder is being manufactured that faces wide web sheets of metal, plastic, rubber and other materials, while maintaining a thickness tolerance of ± 0.0005 in. on the finished stock. This extreme accuracy is achieved through use of a coated abrasive cover, spiral wound on a cast iron back-up roll.

Called a Micro-Grinder, the machine was developed by Curtin-Herbert Co., Gloversville, N. Y., in co-operation with Behr-Manning Corp., Troy, N. Y.

Accuracy of the finish-ground web depends on the hardness of the material to be ground and the amount of stock to be removed. On relatively soft non-metallics, 0.0625±0.0005 in. of stock can be removed in one pass through the grinder. Extremely hard non-metallics, such as mica and laminated phenolic, have been given an 0.030±0.0005 cut at one pass.

The coated abrasive cover is spirally wound around a centrifugally-cast normalized cast iron drum that is machined to a tolerance of ± 0.0005 in. Edges of the cover do not overlap but are butted together. This mounting technique permits use of the entire drum periphery.

A series of clamps fastened to movable heads on each drum-end secure the cover. These heads exert tension on the coated abrasive cover outwardly and in the direction of the spiral.

Web stock to be ground is fed into the grinding area by a series of rubber-covered pinch rolls. Mounted directly under the grinding roll is a precision ground steel billy roll that supports the stock as it is being ground.

Machine widths range from 12 to 80 in., but widths of 40 to 52 in. are standard. A version of the machine has found wide use in the textile industry.

STEEL: Industry Gets Bigger Bite

Consumer goods industries allocated 1,480,000 tons extra steel for first quarter... Can makers get most, automotive industries follow.... DPA promises more later if possible.

Automobile manufacturers and other consumer hard goods industries are to get a supplemental first quarter allocation of steel of 1,-480,000 tons.

Defense Production Administration promises that if its continuing "review" indicates any open space remaining on mill order boards as of about Dec. 10, another supplemental allotment will be made.

The extra allocations include 85,000 tons of steel for Mutual Security Agency award and export in addition to 17,000 tons for Canada.

Where It Goes—Broken down by types, the additional steel allocaions will be:

Tin mill products, 550,000 tons; cold-rolled sheet, 393,000 tons; drawn wire, 174,000 tons; hot-rolled bars 1-in. and under. 92,000 tons; hot-rolled sheet, 97,000 tons; cold-rolled strip, 47,500 tons; and galvanized sheet, 42,500 tons.

Largest bite out of the supplemental steel pie will go to manufacturers of tin cans and other metal containers — about 560,800 tons. Nearly all will be in the form of tin mill products.

Next biggest share will go to the automotive industries, some 337,000 tons. This will consist of 237,000 tons of cold-rolled sheet, 47,000 tons of hot-rolled sheet, 30,350 tons of drawn wire, and 19,600 tons of small bars, 1-in. and under.

Remainder will consist of galvanized sheet. No additional cold-rolled strip will be allocated the auto makers.

Civilian Goods—Rating third in the pie cutting were manufacturers of consumer durables. This claimant division of National Production Authority was handed 159,000 tons to be parceled out.

It consisted of 65,000 tons of coldrolled sheet, 36,000 tons of drawn wire, 24,000 tons of cold-rolled strip, 15,000 tons of tin mill products. Small quantities each of small bars, hot-rolled sheet and galvanized sheet will be allotted.

The metalworking equipment industry will get 12,000 tons of wire, and 1000 tons each of hot and coldrolled sheet, for a total of 14,000 tons

"Essential" Needs—These supplemental allotments represent about one-half the amount of additional steel which the motor vehicle and other industries had asked. But DPA felt that this would meet the most "essential" current needs and prevent widespread hardship.

On the basis of the basic first quarter allocations, this represents actually about a 33 pct hike for the consumer durables goods industries.

Agricultural equipment manufacturers got 37,000 tons additional in all categories except tin mill products but with more than one-half the total in the form of cold-rolled and galvanized sheet.

Industry Controls This Week

Automotive—SR 25, CPR 34 outlines new methods of calculating ceiling prices for automotive and farm equipment repair service.

Controlled Materials—Amend., Dir. 1, M-47 prohibits use of allotments of controlled materials granted for pro-



"Mon, you've got to have an eye for the future, after Christmas . . . then what?"

duction of new products from being immediately diverted to production of a different product. Amend., M-47B permits CMP allotments received for production of one product to be used in certain cases to make a different product.

Ferroalloys — Amend. 4, M-80 requires that orders for ferroalloys be certified by the purchaser that they will not be used in violation of M-80 or any of its scheds.

Jacks—Revoc., M-83 eliminates requirements for standardization and simplification of jack manufacture.

Machinery—Amend. 1, SR 8, CPR 30 extends the date by which certain machinery manufacturers must choose optional methods of calculating higher ceiling prices. Amend., M-43 transfers responsibility for sponsoring priority assistance applications to obtain construction machinery for Defense Dept. programs to NPA's Civilian Requirements Div.

MRO — Amend., M-79 authorizes manufacturers to accept unrated orders for foreign MRO items in excess of export quotas established under M-79.

Nickel—Rev. 1, CPR 29 revises pricing regulations for pure nickel scrap. Monel metal scrap, stainless steel scrap and other scrap materials containing nickel, chrome, etc.

Priorities—Rev., NPA Reg. 2 requires those who place rated orders for non-controlled materials to cancel such rating when they no longer need priorities assistance.

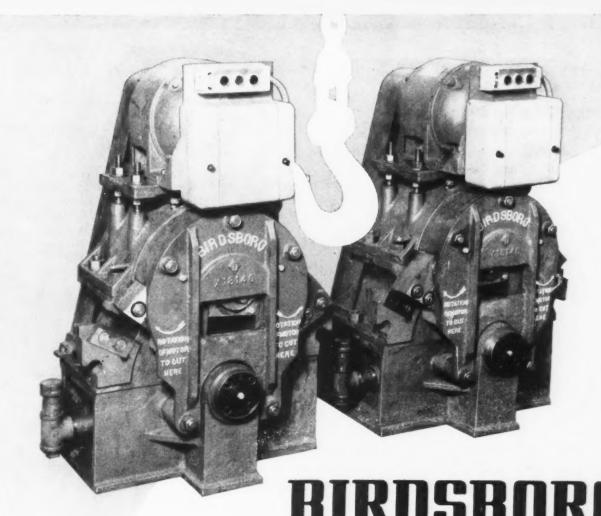
Prices — Amend. 5, SR 4, CPR 7 permits manufacturers who changed their method of distribution since 1950 to apply for uniform ceiling prices.

Services — Amend. 5, CPR 34 changes the cutoff date for recognition of long term contracts for supply of services from Dec. 18, 1950 to Jan. 26, 1951. Genl. Interp. 9 exempts from price control certain services which are incidental to the sale of commodities no longer price-controlled.

Steel—Amend., Dir. 18, CMP Reg. 1 revises upward the automatic allotment limits on procurement of steel controlled materials by Class B products producers during the second and succeeding quarters of 1953.

Sulfur—Revoc., M-69 and Amend., NPA Reg. 1 removes limitations on use of sulfur, and eliminates sulfur inventory controls.

Tools — Amend. 13, CPR 67 and Amend. 57, CPR 22 concern pricing of certain hand tools. subassemblies and parts.



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Complete with electric motor drive and starter in a single unit, Birdsboro Portable Crop Shears can be quickly shifted by crane to any location where cropping is required. No need to lose a single bar for lack of shearing facilities at the right point.

These units, for rod and merchant mills, feature the same skill of design and engineering found in all Birdsboro Mill Machinery. They provide easy-to-operate centralized controls . . . fast positive cutting action . . . and performance that pays off in day-after-day profits.

If your mill operations call for cutting split and cold ends off steel bars, there's a time and money-saving advantage for you in Birdsboro Portable Crop Shears. A Birdsboro Engineer will work with you to help you get the results you want.

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Offices in: BIRDSBORO, PA., AND PITTSBURGH, PA.

November 13, 1952

105

NICKEL: Scrap Ceilings Changed

OPS revises pricing regulations for nickel-bearing scrap . . . Revisions mainly bring prices in line with industry's practices . . . Service, commission provisions clarified.

Office of Price Stabilization has revised its pricing regulation for pure nickel scrap, Monel metal scrap, stainless steel scrap, and other scrap materials containing nickel, chrome, etc. (Rev. 1, Ceiling Price Reg. 29, effective Nov. 8.)

Revision does not materially change general level of ceilings. Main purpose is to bring prices into line with prevailing industry pricing practices.

Revisions-Among the changes

(1) Price control now extends to steel scrap with a nickel content exceeding 6.99 pct, or a chrome content exceeding 10.99 pct.

(2) Services covering preparation of scrap for direct industrial consumption are clarified.

(3) Copper nickel solids and borings and nickel silver solids and turnings, intended to be covered under CPR 46 for copper and copper alloy scrap, are now specifically excluded from the revised CPR 29 if they meet the specifications set forth in CPR 46.

Broadened-Table "A" has been broadened in several respects:

(1) Ferro - nickel - chrome iron scrap containing 20 to 90 pct nickel now specifically excepts American Iron and Steel Institute stainless steel grades.

(2) Standard shapes of sheet, skeleton and rods have been added to the category covering Monel clippings and rods.

(3) A new category has been added covering grades of miscellaneous nickel-bearing scrap, including grindings, spent catalyst, sludges, and mud and filter cakes.

(4) A preparation fee may now be divided between a dealer selling directly to a consumer and another dealer who participates in the

Definitions have been added for

"stainless steel" and for "nickelbearing stainless steel" to conform with industry concepts.

Stainless Changes-Ceilings for volume grades of nickel-bearing stainless scrap remain unchanged.

The revised regulation establishes a ceiling of 40¢ per lb of nickel content and 12¢ per lb of chrome content for sheets, clippings and solids. For turnings and borings a ceiling of 15 pct less than the applicable ceiling for sheets, clippings and solids is set.

This does not apply, however, to nickel-bearing stainless steel scrap with a nickel content of 3 pct or less. This is priced as a straight chrome grade under Table "B."

To further conform a differential of \$5.00 per ton less than the carload price is established on less than carload lots sales of straight chrome stainless.

The revised regulation spells out the specific forms in which stainless scrap must be prepared or generated before a premium becomes payable.

Defense Contracts-

Contracts Reported Last Week

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Spare parts, var, \$31,237, Cleveland Trencher Co., Cleveland.

Spare parts, var, \$178,839, Caterpillar Tractor Co., Peoria, Ill.

Spare parts, var, \$118,008, International Harvester Co., Meirose Park, Ill.

Motors, 6768 ea, \$289,976, Redmond Co., Owosso, Mich.

Frame assy, 54 ea, \$41,068, Merz Eng. Co., Indianapolis.

Replenishment of motor vehicle, 12000,

Frame assy, 34 ea, \$11,000,
Co., Indianapolis.
Replenishment of motor vehicle, 12000,
\$30,861, American Brake Shoe, Detroit.
Replenishment of motor vehicle parts,
40000, \$113,200, Willys-Overland Motors,
Inc., Toledo.
Replenishment of small arm parts, 2170,
\$35,739, Rayard Electronics Co., Inc.,
Disingleinia.

Replenishment of tank and combat vehicle parts, 1000, \$40,580, General Motors Corp., Detroit, R. C. Campbell.

Replenishment of tools, 750, \$55,650, emsel Industries, Inc., Chicago.

Replenishment of service arm parts, 950, \$104,689, Ray Whyte Electric Products, East Detroit, Mich.
Replenishment of small arm parts, 3400, \$38,026, Clark Cable Corp., Cleveland.
Replenishment of tank and combat vehicle parts, 200, \$72,400, Tulsa Winch, Vickers, Inc., Tulsa, Okla.
Replenishment of motor vehicle parts, 11225, \$58,833, Trainor National Spring Co., New Castle, Ind.
Replenishment of motor vehicle parts, 11225, \$58,833, Trainor National Spring Co., New Castle, Ind.

Replenishment of motor vehicle parts, 90000, \$38,700, Trainor National Spring Co., New Castle, Ind.

Toggle switch, 14823 ea, \$26,250, Herbach & Rademan, Inc., Philadelphia.

Charger assy, 804 ea, \$63,756, Erno Machine Co., Inc., White Plains, N. Y.

Air pump, 106 ea, \$88,796, Bendix Aviation Corp., Teterboro, N. J. Parts, engines, var. \$1,379,369, Titeflex. c., Newark.

Parts, var, \$1,141,574, Bendix Aviation Corp., Sidney, N. Y.

Aneroid shaft & bushing assy, 1092 ea, \$46,158, Bendix Aviation Corp., South Bend, Ind., G. I. Lyman.

Polarized relay, 1791 ea, \$95,389, Fairchild Camera & Instrument Corp., Jamaica, N. Y.

Valve, 4000 ea, \$196,238, Bendix Aviation Corp., South Bend, Ind., G. I. Lyman.

Government Inviting Bids

Latest proposed Federal procurements, listed by item, quantity, invitation No. or proposal and opening date. (Invitations for Bid numbers are followed by "B," requests for proposals or quotations by "Q.")

Bombs, practice, 894000, 6754-O-B, Nov. 28. Hammers, var, 34825, 6797-B, Nov. 26. Thermite plain, 221464 lbs, CML-30-070-53-49B, Nov. 17. Aluminum powdered, 34457 lbs, CML-30-070-53-49B, Nov. 17. Motor assy, 650 ea, ORD-53-SP-76, Nov. 24. Reel assy, 6000 ea, ORD-53-SP-78, Dec. 9. Tube, burster, 642000 ea, ORD-11-173-53-22B, Nov. 14.

Nov. 14. Container, ammo, metal, 546200 ea, ORD-11-173-53-22B, Nov. 12. Switch assy, 525 ea, 1153-32B-B, Dec. 1. Connector receptacle, 13,055 ea, 822-32B-B, Dec. 3.

Dec. 3.
Cable assy, 16400 ea, 745-32B-B, Dec. 3
Cable assy, 16400 ea, 745-32B-B, Dec. 3
Electric drill, 302 ea, 1223/53B, Nov. 17.
Repair parts for clark equipt, 205 itm, 1356/53B, Nov. 28.
Repair parts for GMC Diesel engine, 43 itm, 533-1/53Q, Nov. 28.
Repair parts GMC equipt, 47 itm, 1436/53Q, Nov. 14.
Repair parts Harnischfeger, 71 itm, 1473/53Q, Nov. 14.
Aluminum powdered grain, 116015 lbs. CML

Nov. 14.
Aluminum powdered grain, 116015 lbs, CML 41-040-53-18B, Nov. 14.
Pin cotter, 2540000, 53-406-B, Nov. 24.
Washer, 7850000, 53-410-B, Nov. 24.
Conveyers, gravity roller, 16477, 635-Q, Nov. 17.
Reamers, 850 set, 67790-B, Nov. 17.
Gage, alignment assy, 200 ea, 53-103B, Nov. 21.
Gage, master, 200 ea, 53-014B, Nov. 21.
Axe, 426 ea, SF-344, Nov. 12.
Tools, 1944 ea, SF-344, Nov. 12.
Switch rotary, 20500 ea, 761-32A-B, Nov. 28.
Bar actuator electrical switch, 7750 ea, 821-32B, Nov. 28.
Clamp, 193,800, 813-32D-B, Dec. 1.
Pumps, distiller condensate, 148, 6184-S, Nov.

Pumps, distiller condensate, 148, 6184-S, Nov.

Pans, drain, iron, 4165, 6799-B, Nov. 24.

Pans, drain, iron, 4165, 6799-B, Nov. 24. Guns, lubricating, 50500, 6780-B, Nov. 17. Wrenches, 35790, 6791-B, Nov. 18. Wrenches, 66420, 6796-B, Nov. 28. Support assy, 175 ea, 53-180B, Nov. 14. Shaft, 4 line items, 500 ea, 53-180B, Nov. 14. Transmission assy, 2 line items, 100 ea, 53-180B, Nov. 14. Yoke & arm assy, 3 line items, 170 ea, 53-180B, Nov. 14. Axle & axle assy, 3 line items, 265 ea, 53-180B, Nov. 14.

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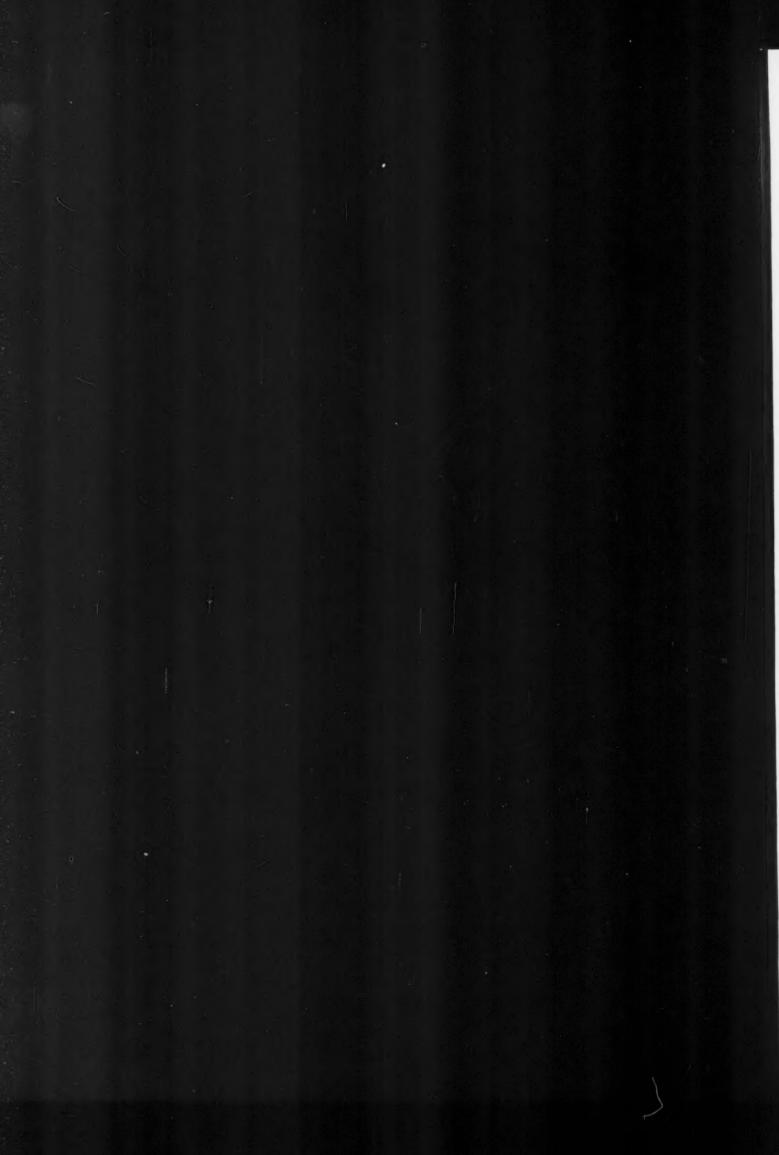
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(THE EQUIVALENT OF)

3389 blanksthissize

A sheet of exactly .022" strip steel the size of this page (814" x 1114") weighs 9.4416

ounces. The same size sheet of .024" (.022", .002" oversize)

with the square punched out weighs the

same.

in every ton if the .022" strip steel you order actually measures .002" oversize

footage loss increases as thickness increases; decreases as gauge decreases.

the precision gauge tolerance of cmp IHINSIEEL protects you against such costly losses, insures maximum practical yield per ton



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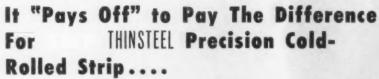
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See next page for list of THINSTEEL products.

If your blank size is SQUARE, round, oval, or any other shape, obtain more blanks per ton CMP

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THINSTEEL



Pay more for Thinsteel and cut costs; more than for run-of-mill strip or sheet, that is. Unusual, isn't it, for a steel producer to say, "Buy our steelit costs more money." But it's not because CMP Thinsteel strip sometimes costs more than sheet coils or run-of-mill strip that it is to be recommended but because the use of this precision product can well mean a lower end product net cost.

And how is this possible? Because in addition to the greater area or larger number of square feet per ton due to the close gauge tolerances inherent in CMP strip, but also because the characteristic of uniformity extends to physical properties, finish, etc., which prolong die life and mean fewer rejects. If this is true, obviously the first steel cost is not the important consideration but rather your attention should be focused on the end product cost. We'd like to test this theory in your operations and for your end products and we think it's worth your while to investigate the accuracy of these claims for your particular processing operations. If sheet coils or run-of-mill strip meets with your full approval and gives you complete satisfaction then you don't want to buy CMP Precision Thinsteel.



TEMPERED SPRING STEEL STAINLESS STEEL

CMP THINSTEEL products can be ordered direct from the mill, or for less than mill quantities or for emer-gency service needs, from following warehouses:

The Kenilworth Steel Company, 750 Boulevard, Kenilworth, New Jersey, 'phone N. Y. COrtland 7-2427 or N. J. UNionville 2-6900.

Precision Steel Warehouse, Inc., 4409-4425 West Kinzle Street, Chicago 24, Illinois, 'phone COlumbus 1-2700.

The Cold Metal Products Company of California, 6600 McKinley Avenue, Los Angeles, California, phone Pleasant 3-1291.



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YOUNGSTOWN I, OHIO

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Industrial Briefs

Granted Franchise—Mazzoni Motors, Inc., Milwaukee, has been granted a WILLYS-OVERLAND franchise for distribution of the Farm Jeep and Jeep implements.

Merged—Sloss-Sheffield Steel & Iron Co., Birmingham, has been formally merged with U. S. Pipe & Foundry Co. and will henceforth be known as Sloss-Sheffield Steel & Iron Div. of U. S. PIPE & FOUNDRY CO.

Ground Broken—BAKER STEEL & TUBE CO., Los Angeles, has announced that ground has been broken for construction of a warehouse which will double the size of the present facilities.

Exhibit — Follansbee Metal Warehouses, division of FOLLANSBEE STEEL CORP., will give over part of its Rochester, N. Y., warehouse for an exhibit of sheet metal working machines during the first week of December.

Elected — A. M. Cox, president of Pittsburgh Commercial Heat Treating Co., Pittsburgh, was elected president of the METAL TREAT-ING INSTITUTE.

Honorary Degree Received—Otto F. Sieder, executive vice-president and general manager, THE H. K. FERGU-SON CO., of Cleveland, received the honorary degree of Doctor of Science from Lafayette College at Easton, Pa., recently.

Dedicated Plant—Recently HEWITT-ROBINS INC., dedicated a \$1 million addition to the company's conveyor belt plant in Buffalo with an Open House.

Congratulations—Charles R. Hook, board chairman, ARMCO STEEL CORP., was honored recently with a banquet given by more than 600 of his co-workers celebrating the anniversary of his 50th year with Armco.

Sale Approved — Reconstruction Finance Corp. has approved sale to REPUBLIC STEEL CORP. of an industrial building in Cleveland.

Manufacturing Plant — PARKER RUST PROOF CO. has opened a new manufacturing plant to serve East Coast customers at Mountain View, N. J. Receives Contract — LURIA ENGINEERING CO., Bethlehem, has received a contract for two new steel-frame buildings from Kenwood Steel Buildings, Inc., Chicago, to be erected for Combustion Engineering-Superheater, Inc., New York.

Named Distributor—Royston Laboratories, Inc., Blawnox, Pa., have been named distributors for DOW CHEMICAL CO. magnesium anodes for the protection of underground and underwater structures.

Appointed—THE PARKER APPLI-ANCE CO., Cleveland, has appointed Palmer Supply Co., Seattle, as a franchised distributor of industrial tube fittings and tube fabricating tools.

Elected—Frank Christenson, Refractory & Insulation Corp., New York, was recently elected president and chairman of the board of the INDUSTRIAL MINERAL FIBER INSTITUTE.

Moved—ABBOTT SCREW & BOLT CO., Chicago, has moved to its permanent location at 1728 W. Walnut St.

Plant Expanded — WENDT-SONIS CO., Hannibal, Mo., has expanded its plant with a new addition that doubled the manufacturing area.

New Division—A new division to be known as the Mechanical Power Transmission Div., has been set up to handle Multi-V-Drives and Allspeed Drives of WORTHINGTON CORP. at the Oil City, Pennsylvania plant.



Foreign Research Center—The cornerstone for a new research center at Frankfurt-Main in Germany, to serve the industry of that country, was placed recently. The new BATTELLE MEMORIAL INSTITUTE for Germany is being established by Battelle Memorial Institute, Columbus, Ohio.

Records Broken — UNITED STATES STEEL CORP. broke all production records in October by turning out a total of 3,195,761 net tons of steel, an increase of nearly 120,000 tons over the previous high mark of 3,076,575 net tons in March, 1952.

Earnings Announced—INTERLAKE IRON CORP., Cleveland, announced consolidated net earnings for the first 9 months of 1952 of \$3,219,622.

New Offices—MAJAC ENGINEER-ING CO. has opened new offices at 189 Freeport Road, Blawnox, Pa.

Studying Our Techniques—Goal of a study being made in the United States by a group of management and technical experts representing the Yugoslav iron and steel industry is technical knowledge leading to the improvement in quality and quantity of Yugoslav iron and steel production. This study is part of the MUTUAL SECURITY AGENCY'S productivity and technical assistance program for Yugoslavia.

New Quarters—EXCEL STEEL CO. has moved its New York office to larger quarters at 141 East 44th St.

Appointed — Industry Services, Inc., New Orleans, has been appointed distributor for Baker Industrial Trucks in the Delta States area by THE BAKER-RAULANG CO.

New Corporation — CARTER CONTROLS, INC., a company manufacturing hydraulic and pneumatic equipment, has been formed recently. J. Carter Miller is the founder and president.

Net Earnings Announced — BASIC REFRACTORIES INC., Cleveland, have announced their third quarter earnings are \$138,931, after charges.

Supplies Entire Line — LAKE ERIE ENGINEERING CORP., Buffalo, has supplied Central Foundry of Holt, Ala., with an entire line of hydraulic presses for the manufacture of artillery shells by cold extrusion.

No Curves on Defense Highway

Defense spending in '53 to be at same level as this year . . . Shift allocations from plant construction to materials production . . . But consumer demand slips—By F. Sanderson.

Defense production in Canada continues to expand and is largely responsible for the high rate of employment. But there are indications of softening demand for consumer goods. Inventories are mounting.

New defense plants are swinging into operation and contract placements have been running higher recently. Most war industries have prospects for heavy production schedules during the next 2 or 3 years. For the coming year, defense spending is expected to run about the same as '52's \$2 billion.

Shift Spending—While the outlay in 1953 will show little change, expenditures will be allocated differently. During the past few years much of the government's spending was for plant construction. In the future, accent will be on materials production.

A survey indicates that much more will be spent on weapons, ammunition, motor vehicles, aircraft, shipbuilding and electronics; less on construction, clothing and mutual aid. There are also prospects of a cutback in Canadian spending abroad.

Consumer Goods—Industries in the consumer goods field are not as favored by prospective orders as war industries. Consumer buying has slipped off and salesmen have been forced to hustle for business.

There are still heavy stocks of 1952 cars available with new models about ready to hit the market. The Canadian automotive builders are somewhat more favored than other manufacturers because in addition to public demand they have large government orders.

Soft Spots—Makers of electrical appliances are pushing for business.

But sales have slipped from the previous peak. Inventories are piling up and it is questionable how long present production schedules will be maintained.

In the TV field, business has been brisk since the Toronto and Montreal television stations went on the air. But even here sales are beginning to taper off. Price cutting is becoming more common.

Agricultural equipment builders are set for the present and report sales for the year running at a record level. Railroad rolling stock manufacturers are operating at capacity. They have sufficient backlogs to maintain present operating rates for the next year or two.

Steel Easing—H. G. Hilton, president, Steel Co. of Canada Ltd., states supplies of steel are increasing and may become adequate in the near future, although demand has shown no decline. New capacity coming into production in all the major steel companies has already



eased pressure in international markets. This condition is reflected in Canada by increased steel imports. for s

Although no additional steelmaking furnaces are yet in operation in Canada, output of ingots climbed 5 pct in the first 8 months of the year.

Mr. Hilton is optimistic regarding raw material supplies for steel mills. If the recent rate of iron ore deliveries can be maintained, he believes stocks will be ample.

Steel Production—Canada's production of primary iron and steel shapes in July, 1952 was 386,054 net tons, as compared with 410,335 tons in June and 410,335 tons in July, 1951

Shipments of primary iron and steel shapes for sale in July rose to 270,235 net tons from 260,685 tons in June and 242,633 tons in July a year ago.

Railroad Order — Canadian National Ry, has ordered 300 units of passenger equipment costing around \$50 million. This is the largest order placed by CNR for passenger equipment since 1940.

Delivery of the new equipment will extend over the next 2 years. Canadian Car & Foundry Co., will build 161 first class coaches. Balance of the order goes to Pullman Standard Car Co.

Slowdown—Consolidated Mining & Smelting Co. is limiting custom smelting of lead and zinc concentrates at its Trail, B. C., smelter. Large shippers have been advised to hold back shipments or use other smelting facilities.

Reasons for the cutbacks are mounting stocks of concentrates awaiting treatment at Trail and the surprisingly large lead production from the company's Sullivan mine. Power is another factor.

Present situation is expected to ease early in 1953, but some British Columbia producers have been forced to shut down. One producer seeking another smelter said the best U. S. bid would have forced an overall loss.

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Ecorso, Detrait 29 Print 20 Print 2

NATIONAL STEEL CORPORATION

The Automotive Assembly Line

Chevrolet Gets Set for Competition

Chief Engineer E. N. Cole oversees planning . . . Drives to keep firm on top . . . Engineering staff enlarged, research section set up . . . Trucks stressed—By R. D. Raddant.

One of the biggest questions in the auto industry concerns the long range plans of Chevrolet.

Some of the answers were supplied by Edward N. Cole, Chevrolet's new chief engineer. Mr. Cole, former chief engineer at Cadillac and more recently plant manager of Cadillac's Cleveland tank plant,

the most important to Mr. Cole himself, was creating a new post of director of research and development. At Cadillac, Mr. Cole had insisted on a similar section.

Looking Ahead—He considers it of vital importance to have this section completely divorced from engine, Mr. Cole was expected to lead the development of Chevrolet's entry into the V-8 field.

He makes no secret of the fact that Chevrolet is working on a V-8, but will give no indication that it is definitely in the wind for 1953. "And it's not the only engine we are working on," is his reply.

Another safe prediction is a major realignment of Chevrolet's production facilities which Mr. Cole calls "an integrated program of rehabilitation." This probably means that some of Chevrolet's older plants may find vastly revised operations in them, particularly when and if a new engine is placed in production.

Rising Barometer—The automobile market is considered an economic barometer in many other respects other than just how many cars are sold.

For example, if the predominant trend is toward deluxe models with a lot of extras and mechanical gadgets, it obviously points to a high average income plus an expectancy that it will continue through duration of time payments.

The market now shows unusual strength in all departments. Not only are more than 80 pct of 1952 cars of the deluxe variety, but the number of expensive extras is high.

Estimates are that 2 million automatic transmissions will be built in 1952, 130,000 Autronic Eye headlight dimmers, 300,000 power steering units, 550,000 overdrives and 150,000 power seat movers or window lifts.

Workhorse — Automatic transmissions, which were originally introduced as luxury features, will make their appearance in the workhorse field in 1953 trucks of the panel and pickup variety.

First to announce the availability of a fully automatic transmission on its 1953 trucks was the Ford Motor Co. It will be optional equipment on the new line of F100

A	atomotive Pro	duction	
(U	. S. and Canada (Combined)	
WEEK ENDING	CARS	TRUCKS	TOTAL
Nov. 7, 1952	117,197*	32,567*	149,764*
Nov. 1, 1952	122,888	32,149	155,037
Nov. 1, 1951	90,572	26,770	117,342
Oct. 25, 1951 .	93,576	25,167	118,743
*Estimated		Source:	Ward's Reports

reported last week some of the groundwork that has been laid in Chevrolet planning.

In less than 6 months he has reorganized the department along lines that clearly point to some of Chevrolet's major objectives in the intense competitive period that is predicted in the automotive industry.

Trucks Emphasized—One of the major points is the greater emphasis that will be placed in the commercial or truck field. Shortly after taking over as chief engineer, Mr. Cole set up a separate section devoted to truck engineering.

The next move became known in Detroit as "knocking out the walls" at Chevrolet engineering. Two chief assistants were increased to five, with equivalent staff expansions down the line. All were picked as specialists in particular fields.

The third point, and probably

what he calls "bread and butter" problems. It must be free to look ahead to future concepts of design and engineering that will someday be incorporated in Chevrolet design. This move completely divorced production engineering from the experimental end.

Finally, the new and vastly expanded Chevrolet engineering has to have the facilities to work. Within a few weeks, Chevrolet will disclose plans for new headquarters for central engineering.

Reading between the lines, it is obvious that General Motors has picked the youthful Mr. Cole, (he is 43), to provide much of the initiative that Chevrolet needs to maintain its top position in the industry. Competition has strengthened and expanded engineering will play a key part in the drive to stay ahead.

V-8?—As one of the developers of the Cadillac high compression

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THE IRON AGE

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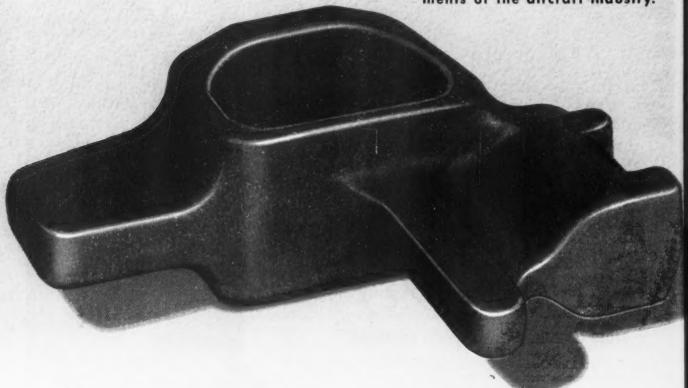


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series trucks and later in the year will be available for the Ford parcel delivery trucks.

"Ease of driving and reduced operator fatigue, plus economy which averages approximately the same as conventional drive, make the fully automatic Ford transmission an outstanding performer," reported L. D. Crusoe, vice-president of Ford.

Comfortable—The new trucks will be introduced early in 1953. Other details of the new truck models are still secret, but they are predicted to be significantly changed in design.

The new transmissions will require additional cooling under extreme conditions of operation. To provide for this, Ford trucks will have added a transmission cooler of the oil-water, heat-exchanger type with the water from the engine cooling system used to cool the transmission.

The new truck transmission has a greater pulling power than conventional units. It will be available for light trucks with either V-8 or 6 cylinder engines.

Chevrolet Passes Million Mark

Chevrolet was the first auto producer to pass the 1 million mark in 1952, hitting that figure for the sixth consecutive postwar year.

T. H. Keating, general manager of Chevrolet, said the 1952 volume will give Chevrolet a cumulative domestic postwar production of almost 9 million cars and trucks.

At the same time, Chevrolet, which likes to deal in millions, completed its millionth Powerglide automatic transmission. The Power glide unit in Chevrolet was the first automatic transmission in the low price field.

British Car Production Plummets

British automotive production dropped 30,000 units to 280,000 in the first 8 months of this year. This represents a 9.6 pct decline. Shortages of steel and other materials and the 2-week vacation granted workers contributed to the production lag.

Chrysler Shows New Models Early

When the 1953 DeSoto goes on the market this week Chrysler Motors will have placed three of its four automotive products in the field well in advance of any of its major competitors.

Only the Plymouth remains to be shown as Chrysler cars jumped the gun in the 1953 sales race.

It is too early to determine the extent of the success of the early introduction. However, Dodge reports "unprecedented" on the spot sales following introduction of its models.

Like all Chrysler products this year, the DeSoto is a completely new car with a new body style featuring long and lower lines. The Fire Dome V-8 engine generates 160 hp. The Powermaster 6 is the parallel line.

The new DeSoto shows more chrome with a massive grille and chrome frame encircling grille and parking lights. Chrome fender moldings outline front and rear fenders. The wheelbase has been maintained at 125\(\frac{1}{2}\) in, while the overall length has been increased 5 in.

The car is 1 in. lower but has the same road clearance.

Optional Air Conditioning Offered

Buick will offer "draftproof" air conditioning as optional equipment next year in the 2-door Riviera and 4-door sedan in the Roadmaster and Super series, according to Ivan L. Wiles, Buick general manager.

Cadillac and Oldsmobile GM divisions as well as Chrysler also promise air conditioning for the 1953 models.

The Buick unit will be housed on the shelf in the trunk compartment and filter cool air into the passenger compartment through ducts above the windows.

Buick also announced that its output of hard-tops will be 27.1 pct of total production for the first 9 months of 1952. Buick leads in the production of hard-top automobiles.

THE BULL OF THE WOODS

By J. R. Williams





Industry Sees Good Capitol Relations

Industry is rid of a hostile Administration . . . Controls may linger . . . Can much be done to cut taxes? . . . Easier international situation could lead to dropping OPS—By G. H. Baker.

Business now has every reason to believe that it will have less trouble, less harassment, and real assistance from Washington during the next 4 years.

Fewer controls and a more realistic administration of those which are to remain in effect are to characterize the federal controls pattern.

Controls to Linger—Don't count on any mass revocation of controls at an early date. Such a move is simply not in the cards. Same situation applies to tax reduction. President-elect Eisenhower and his top aides have pledged themselves to an early and honorable termination of the Korean war.

But until this drain on U. S. production brawn and the threat of other world crises which may involve American participation are removed, there can be no real Washington planning for a complete removal of business regulation.

Healthier Atmosphere — Aside from the indicated healthier atmosphere for management and labor, what "Ike" specifically has in mind in the way of removing the many stumbling-blocks to business and industry is yet to be disclosed. Not until he personally appears before the new Congress during the first week of January with his State of the Union message and a detailed program of legislation action will the new pattern begin to shape up.

But the post-election thinking of some of his top advisors, plus the outlines of some basic legislative action that is beginning to take shape within Congress, may be properly translated at this point as producing these results under the new Administration;

Rearmament—"Ike" is to take a good, hard look at the mobilization program in the light of an anticipated peace in Korea. Is full-scale mobilization of industry really necessary? What controls may safely (without letting down our guard) be dropped?

Materials Controls—So long as Communism continues as a universal threat to free nations, a limited degree of industrial mobilization will remain necessary, it is reasoned. This means that some basic controls over production are to remain indefinitely.

It is possible that CMP may be discarded as an unnecessary burden upon business, leaving in effect only a relatively simple system of priorities for military production. Inventory and use controls over such scarce commodities as nickel are to continue indefinitely, however.



Price Controls—Success in bringing active hostilities to an end could mean an end to price controls on April 30. Law under which Office of Price Stabilization now operates expires on that date.

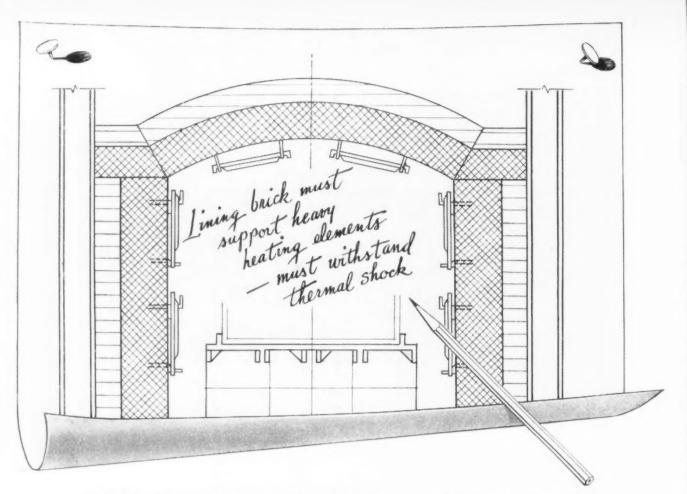
Nearly all key commodities and products have long since been decontrolled, and there is a strong belief among members of both parties that the \$47 million a year it costs to run OPS could be saved.

Wage Controls—Same situation applies here. Since it is generally conceded that prices and wages are inevitably tied together in economic planning, wage and salary controls probably will be permitted to expire along with price controls.

Taxes—Possibility of any early reduction in corporation or individual income taxes is tied directly to the possibilities for peace, a slower rate of defense spending, and reduced military, economic aid to Europe. As a result, there is no immediate prospect for relief in this quarter. But there is a possibility that the excess-profits tax law may expire on June 30.

Ike and Congress—Mr. Eisenhower appears headed for an enthusiastic—but brief—"honeymoon" with the new Congress. His slim working majorities in the Senate and in the House may preclude "rubber-stamp" endorsements of his programs by the Congress. New Republican leadership is counting heavily on support from Southern Democrats.

Few Changes—Little attention has thus far been given by the public to the fact that the landslide vote for "Ike" actually wrought few changes in Congress. Shake-up in Senate and House seats is one of the smallest in years. All but 15 Senators and about 80 Representatives will be holdovers.



Which insulating fire brick would you use?

Every furnace lining presents a different problem in insulating fire brick selection. Resistance to a special atmosphere may be the chief consideration in one job, while in another, insulating value or strength may be more important.

In this electrically-fired heat treating furnace, for example, a strong brick was needed to support the heating elements on the walls and arch. At the same time, the brick had to withstand the sudden thermal shock of frequent door openings.

To satisfy both these requirements, Armstrong's A-23 Brick were specified. This is the strongest brick in Armstrong's Line and is rugged enough to carry the heavy heating elements. A-23's also stand up under thermal shock and are highly resistant to shrinking and spalling.

Each brick type in Armstrong's Line is formulated to give you the proper balance of physical properties. All are light in weight, strong, and highly efficient. Mortar keys securely to their surface, insuring a firm, lasting bond.

Choosing the right brick—or combination of brick—for a specific job calls for a sound knowledge of brick performance and furnace design. That's why it's a good idea to call on the Armstrong engineer whenever you have a refractories problem. He'll study your specifications and help select the best brick for your job—perhaps help you increase furnace efficiency as well. Just call your near-by Armstrong office or write to Armstrong Cork Company, 4911 Mulberry St., Lancaster, Pennsylvania.



ARMSTRONG'S INSULATING REFRACTORIES

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STEEL: Transportation Needs Cited

DTA places second quarter bid . . . Asks enough to build at least 1.5 million cars, 325,000 trucks . . . Repair parts needs total \$588 million . . . Freight car, tug, barge goals.

Looking forward to a less hectic 3 months, Defense Transport Administration has put in its bid for enough controlled materials for the second quarter to allow the automotive industry to produce not less than 1.5 million passenger cars and 325,000 trucks.

In addition, says DTA, the controls agencies must set aside enough steel, copper and aluminum to permit production of a minimum of \$588 million worth of replacement parts—if the transport systems are to be kept running.

Meanwhile, National Production Authority was getting ready to issue CMP tickets for a supplemental 337,000 tons of steel for the industry, resulting from open mill space.

It had originally allocated enough steel to make approximately 650,000 to 700,000 passenger cars. It was felt in government quarters that this would go a long way in matching first quarter copper and aluminum allocations which were held sufficient to make more than 1 million units.

More conservative officials, however, felt that the supplemental allotment would not permit an output increase of more than 200,000 units—or about 850,000 in all for the first quarter.

If DTA is successful in getting the steel, copper and aluminum it is requesting, this would represent a 50 pct hike in allowable unit production of pasenger cars—actually permitting close to capacity, or a rate of 6 million units a year.

Trucks — Also, assuming that DTA is granted its materials claims, truck production would be permitted at a rate of 198,250 light vehicles, 87,750 mediums, and 39,000 heavies.

In addition, DTA is claiming enough materials for 110,000 truck bodies including 5000 school bus bodies, 14,500 truck trailers, and 2000 complete commercial buses.

Freight Cars—Turning to the railroad freight car program—now 57,000 cars behind schedule for the year—DTA says that Defense Production Authority must find materials enough for production of 27,000 freight cars plus 1500 tank cars during the second quarter.

In order to maintain railroad and transit lines fully the agency adds, it will be necessary to have 450,000 tons of new rail for replacement purposes alone.

Shipping—For inland waterways and harbors, DTA is putting in a claim for enough materials for 287 vessels, 82 of which are now under construction and 205 scheduled to start during the April-June period.

Included are 15 tugs and tow-

boats, 14 oil and other liquid cargo barges, and 42 dry cargo and general purpose barges, all of which are now started.

Scheduled to be started during the second quarter are 14 tugs and towboats, 41 oil and liquid barges, and 125 dry cargo barges.

New Inspection Stamps Schedule

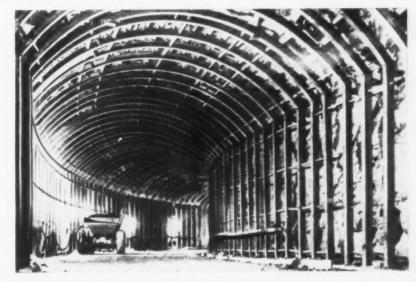
Two stamps—one round and one square—are soon to replace the 39 different stamps now being used by the Army, Navy, and Air Force in inspecting the products and materials bought from industry.

Circular stamp is to indicate inspection of the goods by an authorized representative of the Defense Dept. Square impression will denote acceptance.

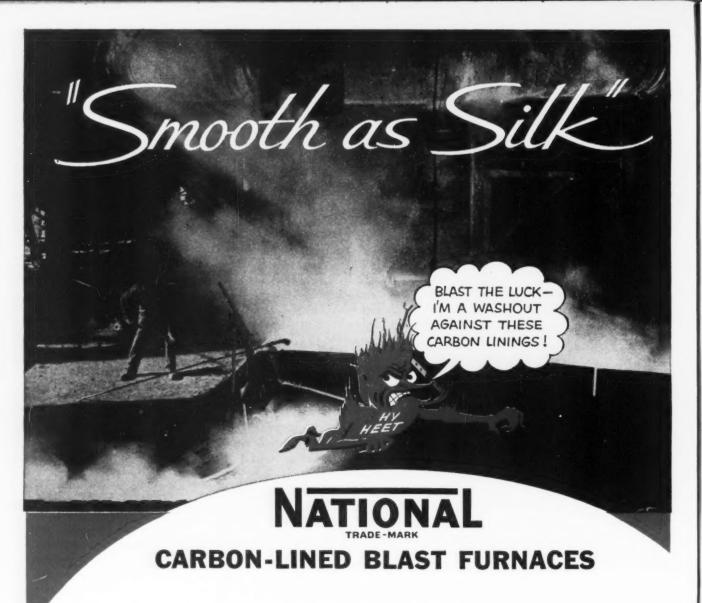
Deadline for universal military use of the new stamps is July 1.

Effect of the simplified inspection and acceptance procedure upon industry is to assure manufacturers of the quality of materials furnished by the government. And the new markings will provide identification of new materials.

Fewer inspection personnel stationed at plants and warehouses also is expected to result. Defense Dept. says the new common-marking system means that only one Defense Dept. inspector now will be stationed at plants.



SUBTERRANEAN: Entrance to a 3-story "underground Pentagon" at Camp Ritchie, Md., 65 miles north of Washington. Shelter, according to the Washington Post, is to be used by the military if the nation's capital is ever bombed.



Typical of the many comments favoring carbon-lined furnaces after the recent strike, was that made by the manager of a large eastern mill.

Describing his carbon hearths as coming back on blast "smooth as silk", he joins the many other users reporting faster, easier, more economical return to normal operation with carbon lined furnaces than with any other type of lining.

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Los Angeles Cracks Down on Smog

Egged on by exasperated citizens air pollution control board puts pressure on industry . . . No plants closed yet, but firms must show equipment orders—By T. M. Rohan.

The air pollution control board in Los Angeles really swings a baseball bat. With the blessing of a smog-exasperated public, it is putting the squeeze on more and more.

Although no plants have actually been shut down, only last minute scrambling for smoke control equipment has prevented it in many instances. Firms whose emission of solids into the air exceeds the lawful percentage are soon visited by an inspector from the office of Executive Director Gordon Larson. The inspector sticks to the letter of the law.

Unless the plant can show a firm order placed with a reputable control equipment manufacturer and a reasonable delivery promise, it can be served with an injunction and forcibly shut down. Allowable emission is based on the amount of material processed, running 6.30 lb per hr solids for a 4500 lb per hr process.

If equipment is on order but has not arrived, a "variance" may be granted allowing them to operate temporarily. In some instances fines up to \$1,000 have been levied, mostly against small and transient type operations.

Too Expensive—Foundries are among the principal industries affected. Many can ill afford control equipment. Four have court injunctions against them now. One has already installed equipment but the board maintains it doesn't meet standards so a closing is possible.

The three major types of control devices are a bag house type which is good for one or two cupolas and runs about \$20,000 per cupola; an air fluid scrubber item;

and the electrostatic precipitator for larger operations.

About 12 foundries have dodged the problem entirely by tearing out cupolas and putting in gasfired Stromen or Redea reverberatory type furnaces. These need no control equipment, cost from \$300 to \$6,000.

In the entire county about 535 tons of solids per day are being removed or prevented from going into the air, and the sulphur dioxide content of the air cut 50 pct, according to anti-pollution officials.

Although smog still persists it has a silver lining in the form of 300 tons of free sulphur recovered daily. A whole new recovery industry has sprung up and Hancock, Stauffer and General Chemicals have refinery gas piped directly into their plants for recovery of the sulphur.

Seidelhuber To Roll — Seidelhuber Steel at Seattle, which early this year bought a used mill in



New Jersey, this week has scheduled a trial run on the first section. About 3 weeks of experimentation are planned before formal dedication ceremonies.

New Capital—Axelson of Los Angeles, the West's only major machine tool manufacturer, is getting a new lease on life.

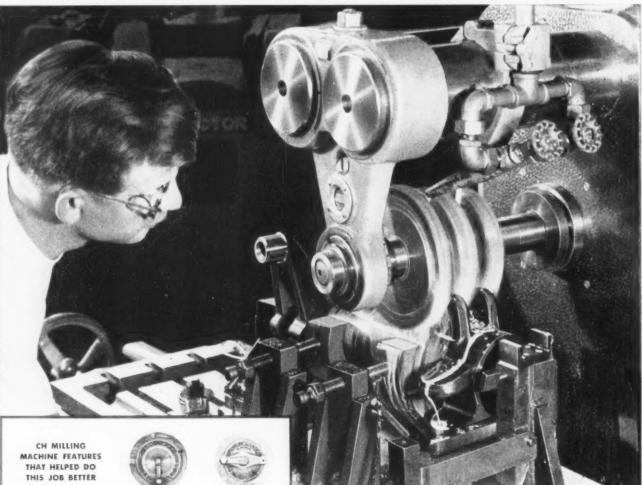
Recently purchased by Pressed Steel Car Co. of Chicago which wanted to diversify its operations, Axelson is looking forward to a rosy future as a division of Pressed Steel which also bought Umpqua Plywood Corp. of Eugene, Ore. Only major change in Axelson's set-up will be stationing of a Pressed Steel executive in Los Angeles with the rhythmic title of resident vice-president.

Known to metalworking principally as a lathe producer, Axelson actually does greater dollar volume business in aircraft subcontract work. Its original line of oil well pumping equipment antedates machine tools by 25 years.

Across The River-Despite crippling freight rates Axelson sells 60 pct of its machine tools east of the Mississippi. Like the rest of the industry sales run hot when manufacturers tool up and cool off in between. Axelson's production averages between 20 and 40 machine tools per month, 70 pct, of course. allocated to defense-connected manufacturers. The firm is now doing heavy business in connection with ordnance work and deliveries are 7 months to a year with up to 18 months on special turret lathes.

Employment is 1800 which has always been non-union despite intensive work by labor organizers. By paying above union scale, allowing overtime on daily rather than weekly basis and setting up pension plans the company has never experienced a strike in its 60 years.

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Speeds and Feeds—24 speed changes from 15 to 1500 rpm. Automatic protecto-mesh mechanism permits non-clash shifting during speed changes. 32 changes from 36" to 90" per minute meet requirements of new metals and cutting tools.



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Greater horsepower — independent drives for spindle, feed and rapid traverse, and coolant. 15 hp to spindle . . . 3 hp for feed and rapid traverse... 14 hp for coolant.

Here's a job handled on a new CH-4 Machine

Job: Menasco Mfg. Co., Burbank, Cal. Straddle Milling Drag Links

Machine: No. 4, Model CH, Plain Style Part: Shock strut for landing gear cylinder Cutter: High speed steel inserted tooth Cutter Speed: 18 rpm, 15/32 ipm feed Chip Load: .005"

Material: 4140 Steel forging, 43 Rockwell

Investigate the new CH line of milling machines. These and other features are job proven to give you cost-cutting results plus greater productivity, better finished products. Contact our nearest representative or write: Kearney & Trecker Corp., 6784 W. National Avenue, Milwaukee 14, Wisconsin.



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Special Tools—Backlogs Loaded

Market for special equipment looks good through 1955 . . . Manufacturers make greater use of tailor-mades . . . Expansion goals for 1953 upped by \$6 million—By E. C. Beaudet.

Builders of special equipment continue to be optimistic about future market conditions. While overall backlogs for machine tools are about 1 year, orders on books of some special equipment firms extend into the middle of 1954. Little concern is expressed over their ability to maintain capacity operations for the remainder of that year.

While accurate forecasts any further ahead than this are difficult to make, some industry spokesmen say the market for tailor-made machine tools will stay firm through 1955 and 1956. Reason is that more and more manufacturers are making greater use of specialized machinery.

Appliance Demand—One of the most active fields right now is in the refrigeration and air conditioning industry. Dearth of these appliances during the hot spells last summer pointed up growing market possibilities.

Some firms are reported considering purchase of special equipment for production of items previously made on standard machines. Replacement programs in the automotive industry are also expected to keep order books firm through 1955 and 1956.

Standard Components — Greater use of standard components in building special equipment has kept costs from reaching higher levels. A few years ago about 30 pct of the components in one builder's special machines were standard. The figure is now close to 50 pct. Increased standardization not only cuts costs but also provides greater re-utilization of these components when the machines are replaced.

With special purpose tools ap-

pearing to be the coming market, builders of standard machines are laying plans for possible future entry. A few have already made inroads and are expected to go further.

Mass Distribution-Part of the trend in this direction results from the philosophy behind planning groups in manufacturing concerns. Greater mass distribution is required to supply the needs of a growing economy. More new projects are undertaken to determine these future needs. New products are brought onto the market more quickly to replace unprofitable or less desirable ones. To achieve higher production rates for wider distribution, special purpose machine tools may be the answer. some industry officials believe.

Expansion — The Defense Production Administration announced last week that expansion goals for the machine tool industry had been raised to \$131 million for 1953. This means builders will have \$6



million more worth of fast tax write-off facilities.

Some sources claim these figures are of little value in judging how much more expansion the industry needs. Since no concrete information is available as to what the future government machine tool requirements will be, the feeling is that little sound expansion planning can be made.

How Much?—A good part of the industry has already expanded as much as it believes is safe to do in face of declining backlogs. Others still have expansion programs underway. Any new expansion called for by the government will take a bit of selling.

What the government probably will call for is further expansion of facilities for building long lead time machines, such as large boring mills, planers and gear hobbers. There is some talk in Washington of a number of large machines required for a new Navy propulsion program.

With the election out of the way some sources are looking for an early release of the Vance Committee report. Once the report is made, the industry is expected to have a better idea of future defense needs for machine tools.

Better Climate—With a new administration slated to take over the government, machine tool builders feel they will be operating their businesses in a more favorable climate. Little effect on present defense procurement of machine tools is expected to result, since the danger of communist aggression is as great or greater than it ever was.

However, the industry is anticipating more just settlements of labor problems and less interference from the government.

Fewer trips to Washington are expected to be necessary in the future. Greater responsibility for handling industry problems is hoped for. This is what the industry wants and the way things should be.

Here's what we mean by <u>SUPERIOR</u> ENGINEERED FOUNDRY PRODUCTS...

PROBLEM:

- Conventional design of cast steel sprocket blank impaired proper directional solidification of the metal, causing uncontrolled shrinkage in the outer rim.
- 2. Assurance of delivery of sound castings was possible only through expensive non-destructive inspection of each blank.
- 3. Casting and machining losses were excessive.

OUR SOLUTION:

POUNDRY ENGINEERED DESIGN to establish a relationship of tooth, web and hub sections which would insure uniform directional solidification of the metal, place metal where needed most and minimize necessity for expensive inspection of each part.

feeding the heavy center section.



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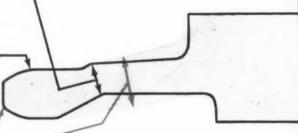
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- Heavy outer rim required excessive feeding risers in addition to the large riser needed for
- Metal solidification starts at thinnest point and progresses toward heavier center section requiring only one feeding riser.



Metal becomes solid at thin section first, cuts off

all feeding action from heavier center section

to outer rim - causing occasional shrink holes

B Modified design gradually increases section from outer rim permitting metal to become solid progressively toward hub, eliminating shrink holes.

RESULT: 17.6% SAVINGS

- 1. Elimination of shrink holes in outer rim through proper directional solidification of the metal.
- Elimination of need for expensive inspection of each part.
- 3. Reduced casting and machining costs.

FLACK LINES . . ORIGINAL DESIGN

RED LINES MODIFIED DESIGN

TOTAL COST OF PART REDUCED 17.6%

YOU TOO CAN GET SAVINGS LIKE THIS! CONSULT OUR PRODUCT DEVELOPMENT SECTION REGARDING YOUR PROBLEM ... WHILE IT'S STILL ON THE DRAWING BOARD!

LET OUR FOUNDRY ENGINEERS HELP YOU CONSERVE CRITICAL MATERIALS

SUPERIOR STEEL AND MALLEABLE CASTINGS CO.

BENTON HARBOR, MICHIGAN, U. S. A.

Since PRODUCTS

PUBLICATIONS

These publications describe money - saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Floor plate

Acme Steel Floor Plate provides concrete floors with rugged protection against the damage and wear common in industrial plants. The floor covering is a special 1134 sq in. unit of 0.068-in. hot-rolled steel designed to cover 1 sq ft of floor area. Each plate contains 100 small rectangular holes and 100 barbed prongs which hold it in the concrete. Spot check of one floor plate installation showed that after 3 years of constant service, wear on the plate amounted to 0.0025 in. More information is available in a new folder. Acme Steel Co.

For free copy circle No. 1 on postcard.

Die-less duplication

Described in a new circular is the Di-Acro line of hand and power operated machines designed to duplicate parts to die accuracy without the expense and time delay required in making dies. The machines can be used for both short run operation and high speed production in medium and lightweight materials. O'Neil-Irwin Mfg. Co.

For free copy circle No. 2 on postcard.

Work gloves

Jomac work gloves have been designed for the toughest handling jobs in industry. Discussed and illustrated in a new brochure, the gloves are washable and can be reused repeatedly. Made of thick twisted loop pile fabric they cushion the hands protecting them against rough surfaces, sharp edges and bruising shocks. They are insulated against both heat and cold. Among the products described in the publication are flame resistant gloves, plastic coated gloves, glove savers, sleeves, aprons. C. Walker Jones Co. For free copy circle No. 3 on postcard.

Metal hose

A 32-p. illustrated catalog on all types of Chicago Metal hose has been released by Flexonics Corp. The catalog covers the company's complete line of Rex-Weld corrugated flexible metal hose, Rex-Tube convoluted hose types and Rex-Flex stainless steel flexible metal hose. Also covered are couplings, special assemblies and installation information. Flexonics Corp.

For free copy circle No. 6 on postcard.

Industrial fans

One of the most adaptable industrial fans on the market is described in a new bulletin put out by Westinghouse Electric Corp.'s Sturtevant Div. The fans can be used for such applications as exhausting smoke, fumes, gases and light dusts, as well as for oven circulation, drying applications and materials handling. Sturtevant Div., Westinghouse Electric Corp.

For free copy circle No. 5 on postcard.

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Postcard valid for 8 weeks only. Information may be secured subsequently by separate letters fully describing each item wanted, including company name.

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THE IRON AGE

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Oil burners

A new oil burner, employing atomizing air at 16 oz, has been developed by Bloom Engineering Co. The unit, described in a new circular, provides equal flame characteristics for both oil and gas. It has a minimum flow of less than ½ gph and turndown of more than 10 to 1. Said to provide extreme flame stability, the burner is controlled through adjustment of the fuel supply valve. Bloom Engineering Co., Inc.

For free copy circle No. 6 on postcard.

Coating chemicals

ACP phosphate coating chemicals are listed in a new brochure. The products described are designed for paint bonding, rust proofing, protecting friction surfaces, improving drawing and extrusion. American Chemical Paint Co.

For free copy circle No. 7 on postcard.

Pipe couplings

Slanted for the jobbing trade is an informative circular that discusses 44 ways in which pipe couplings can be employed. Uses are listed for six different industries and a brief discription is given of the kinds of couplings used in these industries. Pittsburgh Pipe & Coupling Co.

For free copy circle No. 8 on postcard.

Weldments

The Facts About Weldments and Castings furnishes basic information about steel plate fabrication in comparison to castings. It has been written for manufacturers and designers of heavy machinery, equipment, service apparatus and components. Purchasing engineers and production executives will find it particularly interesting. Acme Tank & Welding Div., United Tool & Die Co.

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THE IRON AGE

Post Office Box 77 Village Station NEW YORK 14, N. Y.

Reduction gears

Steam turbines operate most efficiently at high speeds. But many machines cannot be driven at turbine speeds and still give maximum output. By interposing reduction gearing between turbines and driven machines, conventional high-speed turbines can be used for such applications as driving fans, pumps, compressors and pulverizers. Described in a new leaflet is the Elliott Co.'s high speed reduction gears designed for just such purposes. Elliott Co.

For free copy circle No. 10 on postcard.

Shipping containers

Sturdy custom-built boxes made by Rathbone, Hair & Ridgway Box Co. are outlined in a new folder. The company's Superstrong box designs save freight charges, storage space and assembly time. Included among the types of containers described are wirebound boxes and crates, wooden boxes and crates, pallets, corrugated boxes and starch trays. Rathbone, Hair & Ridgway Box Co.

For free copy circle No. 11 on postcard.

Structural shapes

Whatever your requirements for rolled or formed sections, Kling Bros. Engineering Works can engineer and manufacture the exact part to fit the job. Shown in a new folder are a few of the many structural shapes that can be rolled to particular specifications. Advantages claimed for the structural shapes are: Speeded production, reduction of finish machining time, elimination of material waste and cutting of material and labor costs. Kling Bros. Engineering Works.

For free copy circle No. 12 on postcard.

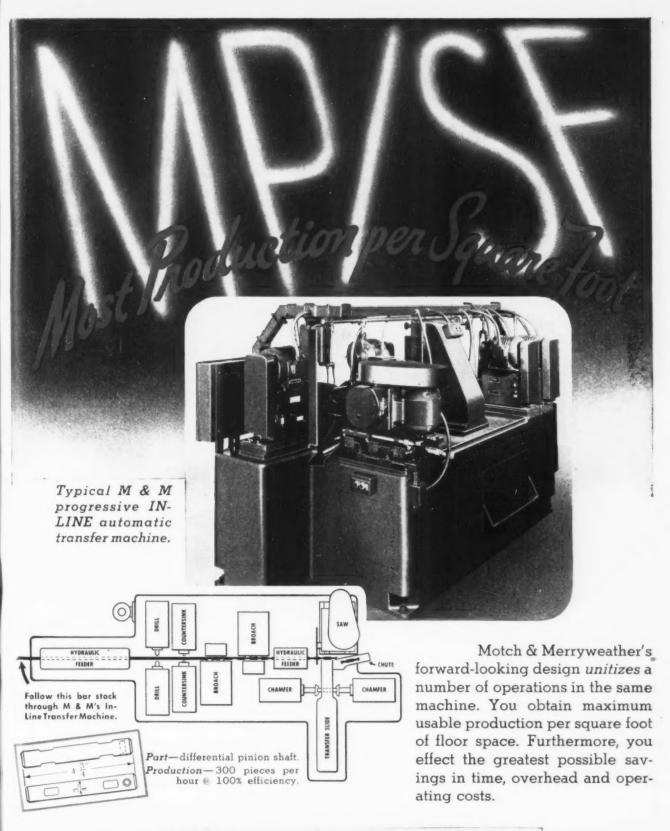
Materials handling

Ways in which inefficient materials handling handicaps production is detailed in a new booklet. Covered are the five major causes of heavy manhour losses and the four basic plant operations in which such losses are most often sustained are thoroughly discussed. Towmotor Corn.

For free copy circle No. 13 on postcard.

(Turn Page)

Nov



Manufactured by — THE MOTCH & MERRYWEATHER MACHINERY [O. —

Builders of Circular Sawing Equipment, Production Milling, Automatic and Special Machines

PRODUCTION - WITH - ACCURACY . MACHINES AND EQUIPMENT



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Grinders

Landis Tool Co. has just published a 24-p. catalog covering its complete line of precision cylindrical grinding machines which includes universal grinders, plain grinders and single purpose and high production types. Pictures, sketches and specifications are used to show the application and size of each type of machine. Landis Tool Co.

For free copy circle No. 14 on postcard, p. 125.

Welding

Fourth in a series of manuals on how to improve welding is available from Eutectic Welding Alloys Corp. More than 100 photos, drawings, charts and diagrams in this particular issue are used to explain how to improve tool and die welding procedures. Eutectic Welding Allous Corp.

For free copy circle No. 15 on postcard, p. 125.

Cutting tools

The DoAll Hefti-Cut is a new heavy duty cutting tool for turning, facing, shaping and boring operations. Among the new features of the unit outlined in a circular is the two-way blank adjustment and clamping arrangement which affords maximum carbide blank usage. DoAll Co. For free copy circle No. 16 on postcard, p. 125.

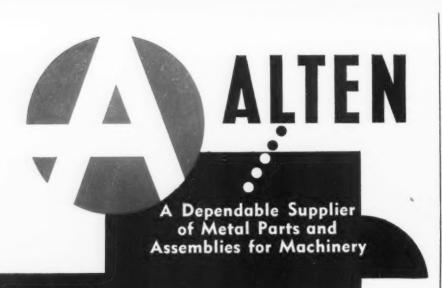
Metalworking machines

Cincinnati Milling Machine Co. has just released its new 1953 general catalog covering the company's complete line of metalworking equipment. Listed for the first time are Hydroform machines and precision grinding wheels. Among the machines catalogued are units for milling, lapping, grinding, broaching, die sinking, metal forming and flame hardening. Cincinnati Milling Machine Co.

For free copy circle No. 17 on postcard, p. 125.

Wire rope slings

Contained in a new handbook is information vital to users of wire rope slings. The handbook gives instructions on how to select and specify slings for every purpose and how to choose correct fittings. Every important type of wire rope sling is illustrated. Shivell-Hall Co., Inc. For free copy circle No. 18 on postcard, p. 125.



HERE'S HOW WE CAN SERVE YOU

Get practical help from our Engineering Department - gain speed and save by sub-contracting medium and large sized intricate jobs involving weldments. machined castings, complete or sub-assemblies. Alten has the size, the equipment, the "know-

Facilities include gray iron and alloy foundries, machine shops. with boring mills, automatic and turret lathes, drill presses, screw machines, broaches, milling machines, surface grinders, external grinders, etc. Structural departments for shearing, rolling. punching, forming, gas-cutting, welding and assembly. In all, two modern equipped plants,

FOR ENGINEERING AND CONSTRUCTION COM-

PANIES - Alten now produces refinery and industrial furnaces, alloy industrial furnace castings, burners, heat exchangers, welded steel fabrications delivered to job sites.

FOR MACHINERY MANU-FACTURERS - Alten builds machine bases, oil pans, pump and compressor parts, hydraulic components and many other machinery parts.

FOR BUILDERS OF EARTH MOVING EQUIPMENT - Alten makes clutch housings, clutch drums, drum spools, brake drums, wheels, transmission cases, etc.

A complete list of production possibilities is almost inexhaustable. Send your inquiries and prints.

"Served by two railroads and many trucklines".

twenty-five (25) acres.

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Write Today for Booklet Describing **Facilities**

"Tycol Apreslube cuts bearing failure... keeps production going at top speed"



That's correct! Tycol Apreslubes are extreme pressure lubricants that stand up under severe heat and moisture conditions, under tremendous loads. They inhibit rusting, and are highly stable.

Tycol Apreslube means lower lubrication costs...longer equipment service life ... and positive protection against excessive gear and bearing wear.

For complete data, call or wire your nearest Tide Water Associated office.

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EQUIPMENT

New and improved production ideas, equipment, services and methods, described here offer production economies . . . just fill in and mail the postcard on page 125 or 126.

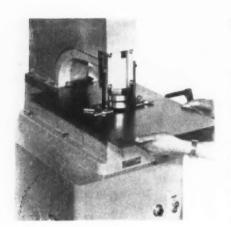


Vertical contouring machine for production work

Fast, accurate machining of rather large round parts such as jet engine compressor wheels is possible on a vertical precision contouring machine. It performs such operations as precision contouring, boring, turning, facing, grooving and rabbeting. Simple controls and automatic functions make it possible for an unskilled operator to do accurate production work on the machine. A tracer controls both

vertical and horizontal movements in contouring operations. The tracer finger follows the form on a hardened and ground flat steel template. Through electronic control adjusted feed per revolution remains constant throughout the cut regardless of variations in the contour or table speed. Normal cycle includes operation of both compound slides in sequence, either operating first. Ex-Cell-O Corp.

For more data circle No. 19 on postcard, p. 125.

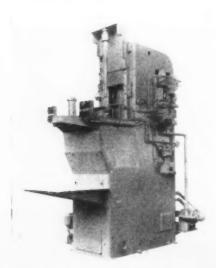


Deep throat punch presses have 5-ton capacity

Two new power operated punch presses, each with a rated capacity of 5 tons, will punch a 4-in. diam hole in 16 gage sheet steel or a 3½-in. hole in 3/16 in. steel plate. Advantages of these deep throated presses are: high rate of production—180 strokes a minute; simple to operate—foot control frees both of the operator's hands for work handling and positioning; safety—all moving parts are housed in a

welded steel cabinet. A complete line of punches and dies are available for these machines; it is a simple matter to change from one operation to another. The machine is portable, need not be bolted down. A material chute is built into the cabinet for delivery of slugs and blanked parts. Flywheel is driven by a ½ hp electric motor. O'Neil-Irwin Mfg. Co.

For more data circle No. 20 on postcard, p. 125.

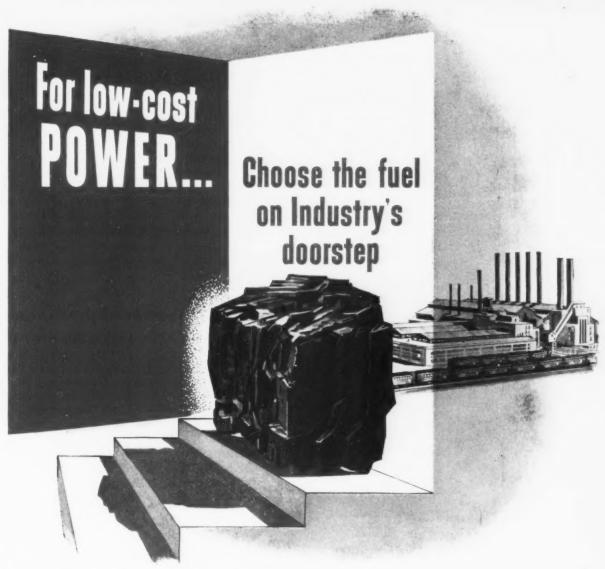


Pull down broach suited for heavy, awkward parts

A pull down broaching machine equipped with interchangeable base fixtures and tooling, broaches round and serrated holes in seven different tank arm and spindle parts. Holes broached are $3\frac{1}{4}$ to $3\frac{1}{2}$ in. diam. Inherent stability has been built into the machine by having the machine slide and retriever slide move on the same ways. The retriever guides the rear end of the broach down through the major portion of the cutting stroke. With

the broach held at both ends during most of the cutting stroke, misalignment and vibration are minimized. The hydraulic receding work slide, which is interlocked to the machine cycle, facilitates loading and increases productivity. An interlock between the retriever and machine cycle automatically stops the cycle if the pull head should fail to connect with the broach. American Broach & Machine Co. For more data circle No. 21 on postcard, p. 125.

(Turn Page)



Coal is where you find it. Fortunately, however, a large share of the nation's operating Bituminous mines are located in Baltimore & Ohio territory—economically accessible to America's great industrial plants. The Bituminous mined here—practically on Industry's doorstep—is of excellent quality and in wide variety; whatever your specific need, there are B&O coals to meet it. Furthermore, the supply is inexhaustible—you can count on an unlimited reserve of B&O Bituminous, even in emergencies, for centuries to come.

When you consider fuel, consider cost—dependability of service—accessibility.
You'll choose the Bituminous mined on the B&O. For advice, ask our man!



BITUMINOUS COALS



BALTIMORE & OHIO RAILROAD

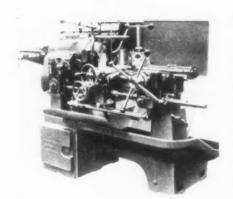
Constantly doing things - better!

Continued

Pressure tester detects leaks in castings

Leaks in gas passages in cast iron automotive engine exhaust manifolds can be detected and located by a new pressure testing machine. Manifolds are manually loaded into the test area of the machine where exhaust gas areas are sealed in three planes by rubber-faced, air cylinder-controlled sealing pads. Resulting pressure buildup in the air cylinder control circuit when pads contact the manifold causes an automatic air test cycle to start. The manifold is charged with a specific volume of air that is trapped in the gas areas. Pressure loss over a given preset test time is indicated by a gage in the head of the machine. Leaks that show excessive pressure loss are located by immersing the head in a builtin illuminated water tank. Modern Industrial Engineering Co.

For more data circle No. 22 on postcard, p. 125.

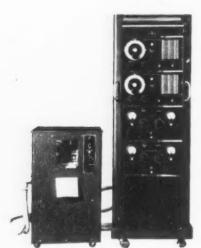


Turret lathe built for high-speed production

The Ward 2C ram type turret lathe produces components from bars up to 11/4 in. diam or from castings. forgings or billets up to 7 in. diam. Spindle is flanged nose type rigidly supported in radial and axial thrust precision ball bearings and heavy duty roller bearings. Rotating parts in the headstock are mounted in ball or roller bearings. Twelve spindle speeds range from

48 to 2041 rpm. From any speed the spindle is stopped by a built-in automatically cam operated spindle brake. Longitudinal power feeds are available to turret slide and cross slide saddle. One-inch diam holes in the turret enable the use of American screw machine turret lathe tools. British Industries Corp.

For more data circle No. 23 on postcard, p. 125.



Scaler-printer designed for high speed counting

New scaler-printer designed for radiation counting as applied in nuclear work, packaging and other applications indicates in printed numerals up to 999 and provides for multiplying this figure by 2, 4, 8, 16, 32, and 64. It will resolve pulses separated by 5 microseconds and performs reliably for indefinite periods of time. An interval timer having a range up to 55 sec allows count accumulation for a predetermined interval, reproducible to within 0.13 sec. An alternative in-

dicator uses three rows of neon lamps in decimal arrangement. This works independently of the printer and can be relied upon separately. The instrument counts electronically, stores the counts in a memory circuit, and after completion of the counting interval, channels the memorized count into a mechanical printer. Capacity of available scaler-printer is 2 channels of 64,000 counts each. North American Philips Co., Inc.

For more data circle No. 24 on postcard, p. 125.



Tooling and aligning by telescope

Optical tooling is possible with a new unit called the Align-A-Scope. The principle involved is similar to but simpler than surveying. Basic lines of sight are established between the ends of the objects to be aligned, together with parallel auxiliary lines and targets. Highpowered telescopes are employed. with magnifying eyepieces used parallel or at right angles to the

line of sight, rotatable to 360°. A built-in optical micrometer can displace the line-of-sight either vertically or horizontally. Operating dials control and indicate this displacement, plus or minus, within 0.050. Inspectors and toolmakers can readily obtain identical correct readings, it is stated. Joel Fox Co.

For more data circle No. 25 on postcard, p. 125.

(Turn Page)

Adjustable squeeze plate Squeeze pressure absorbed by replaceable thrust shoes.

Powered swing head permits simplified 2button control of complete molding cycle.

SPO Builds the Best...

FOR PRODUCTION MOLDING

It's performance that counts in the foundry. High production capacity . . . molds of uniform standard . . . minimum maintenance and replacement . . . and safe, simplified operation are recognized as "musts" by production foundrymen. SPO machines offer these and many more advantages . . . that's why they are the world's most popular line of molding machines.

Replaceable draw cylinder mounted on squeeze past for longer troublefree operation

> Automatic air line lubricator

This Model 2160-C JOLT-SQUEEZE-STRIP/DRAW features a 1500 lb. jolt ... 16,000 lb. squeeze ... adjustable pattern draw (6 to 10").

Adjustable stripping pins accommodate wide range of flask sizes.

Patented SPO "inverted jalt" reduces maintenance and replacement costs to minimum.

WRITE FOR BULLETIN 2000-C FOR COMPLETE DETAILS New fully-automatic electrical controls govern all operations and eliminate guesswork.

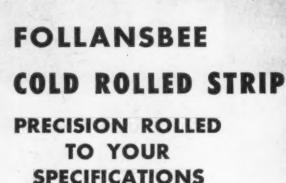
New patented stripping mechanism features both up-strip and down-draw action.



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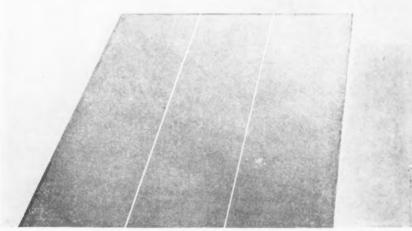




Follansbee offers the special attention and services which only the flexibility of a compact organization can provide. If you need Cold Rolled Strip Steel, Follansbee merits your consideration as a source for your supplies.

Follansbee brings to the rolling of this staple product its many years of experience as a maker of high quality steel specialties. This means that you can rely on Follansbee to furnish you with Strip that meets your most exacting requirements in Temper, Gauge, and Width.

On your next order for Cold Rolled Strip-or other steels -it will pay you to check with Follansbee.



FOLLANSBEE CORPORATION STEEL

GENERAL OFFICES, PITTSBURGH 30, PA.

POLISHED BLUE SHEETS AND COILS SEAMLESS TERNE ROLL ROOFING COLD ROLLED STRIP



FOLLANSBEE METAL WAREHOUSES Pittsburgh, Pa.

Rochester, N.Y.

Fairfield, Conn.

New Equipment

Continued



Speedy thread cutting

A new thread cutting and worm cutting machine, when installed on a standard lathe, reportedly increases speed in cutting threads and worms by nine times over that of lathe cutting by methods generally used; and two times as compared with thread milling. Actual cutting is done by a tool that moves around the workpiece eccentrically at high speed, in a single continuous operation. The equipment cuts long standard V threads, acme, buttress and rounded threads. National Threading Machine Co.

For more data circle No. 26 on postcard, p. 125.

Vacuum fusion unit

A wide variety of ferrous and nonferrous pure metais and alloys including titanium. molybdenum, stainless steels, high temperature alloys, and electronic alloys can be quantitatively analyzed for total oxygen, nitrogen, and hydrogen content with new vacuum fusion gas analysis apparatus. The system, housed in a stainless steel cabinet, is furnished with mechanical and diffusion pumps, mercury, furnace assembly, and built-in control panel. National Research Corp. For more data circle No. 27 on postcard, p. 125,

Gray work clothes

Work clothes made of the new Dynel fabric are now available in an attractive shade of gray which is said to make stains and soil less noticeable. Shirts, trousers and coveralls made of MSA ChemKlos resist corrosive chemicals, as well as wear, moths, mildew, shrinkage, snagging and tearing. Mine Safety Appliances Co.

For more data circle No. 28 on postcard, p. 125.

Welding metal

Chemalloy is a new development that simplifies the art of welding or soldering any grade of aluminum as well as any zinc-base metal such as pot metal or white metal. It requires no flux, no special cleaning or preparation of metal, no special welding equipment, no special skill. The metal is heated beyond 800° F and rubbed on. Sightmaster Corp.

For more data circle No. 29 on postcard, p. 125.

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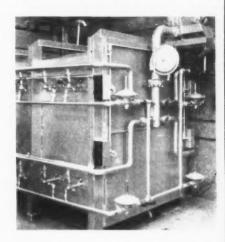
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GE

Combax accelerator is a new, specially prepared, finely divided iron powder for use as a combustion accelerator in metal analysis. It is added to the sample to be ignited in induction carbon apparatus when the sample is nonmagnetic—difficult to fire by induction heating. Fisher Scientific Co.

For more data circle No. 30 on postcard, p. 125.



Car bottom furnace

A car bottom furnace is equipped with special manifolding that permits regulation of the furnace to any desired temperature range and any rate of heating. It is designed to facilitate loading of heavy sections on carburizing boxes. Blower is at the top with the control valve in the vertical pipe. The air line branches off of the vertical pipe to the four groups of burners. Gas cocks and gas regulators are at each corner. Spark ignition transformers are mounted on the corner uprights of the furnace. Waltz Furnace Co.

For more data circle No. 31 on postcard, p. 125.

(Turn Page)





SPECIAL METHODS PRODUCE SMALL QUANTITIES AT MINIMUM COST.

When you need just a few pieces — when you're still in the experimental stage—then an economical, cooperative source of parts is important.

Our Machine-Cut Method avoids custom die costs completely by use of special machinery which skillfully fashions pilot quantities.

Careful calculation determines the point at which labor costs warrant our Short Run Method, which uses simple contour dies and special purpose presses.

Best of all, when you get into large quantities on the experimental part, our STAMPINGS DIVISION is still your most economical producer, using our Production Method. Thus all three methods are at your disposal. And impartial choice of method saves money for you!

SEND FOR INFORMATIVE LITERATURE

STAMPINGS DIVISION



3211 Union Street, Glenbrook, Conn.

New Equipment

Continued



Laboratory furnaces

Unit-package box and muffle furnaces are offered in five different models for analysis, control and production in chemistry, metallurgy and manufacturing. All are dual-purpose units designed for both low and high temperature use. From 600° to 2000°F, routine operations such as ashing, drawing, igniting and sintering, can be performed. Above 2000°F furnaces are equally adaptable for sintering, melting, clinkering, fusing and high-speed hardening. Burrell Corp.

For more data circle No. 32 on postcard, p. 125.

Rubber grinding wheels

An improved line of rubber wheels for grinding ball-bearing raceways provide free-cutting action, minimizing generation of heat and insuring a high degree of accuracy. Chatter is virtually eliminated. Excellent form-holding characteristics and shape maintenance throughout the entire life of the wheels are also realized, it is stated. Carborundum Co.

For more data circle No. 33 on postcard, p. 125.

Cutting fluid

Wax-Cut, a new compound said to improve metal-cutting action and reduce tool wear, is available in concentrated form so that users may prepare their own cutting solutions and reduce costs. Wax-Cut concentrate, a blend of special waxes, can be mixed 10 to 1 with any type oil. S. C. Johnson & Son, Inc.

For more data circle No. 34 on postcard, p. 125 (Turn Page)





Standard Replaceable Cold Formed Offset

WELDING TIPS

Through the development of special cold forming equipment and methods. Weiger-Weed produces offset welding electrodes with these important advantages: . . .

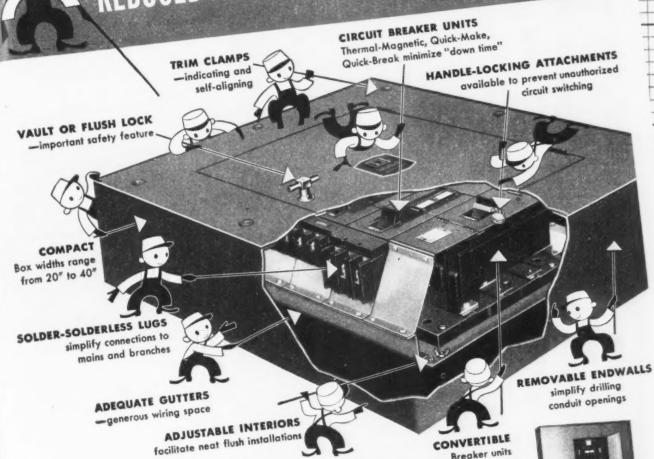
- No loss of physical or electrical properties—cold formed offset tips have the same hardness and conductivity as straight tips.
- No distortion of taper—good electrical contact, no water leaks.
- Full cooling—water hole is as deep as in straight tips.
- · Full workable nose length.
- Economy, quick delivery—most styles are formed quickly from standard straight tips.

Many other special cold formed electrodes to lick difficult clearance prob-

lems can be worked out by WW if quantities warrant the tooling. Give us the details of your problem.

WEIGER-WEED & CO., Division of Fansteel Metallurgical Corp. • 11644 Claverdale Avenue • Detroit 4, Michigan

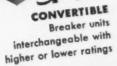




SQUARE D'S TYPE ML CIRCUIT BREAKER DISTRIBUTION PANELBOARDS

provide complete, 2-way protection through the use of thermal-magnetic breaker units. Costly "down time" is held to a minimum since circuit breakers can be reset quickly after the fault has been cleared.

Four circuit breaker frame sizes provide ratings ranging from 15 to 600 amperes, 250 or 600 volts.





Type MLN





SQUARE D COMPANY



WALLINGFORD, CONNECTICUT, U.S.A.

New Equipment

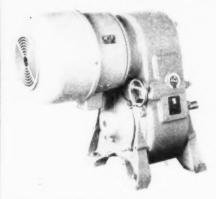
Continued



Simple hand grinder

This machine employs a simple method of grinding perfectly flat and square surfaces, by hand. A 5-in. cup wheel protrudes slightly through the stationary fence along which the work is moved. As center section of fence is on same plane as outer section, a flat surface is produced without the need of expensive fixtures or a skilled operator. Fence is 3^{1}_{4} in. high, $4^{1}/_{2}$ in. wide and 18 in. long. Southwest Machine Works.

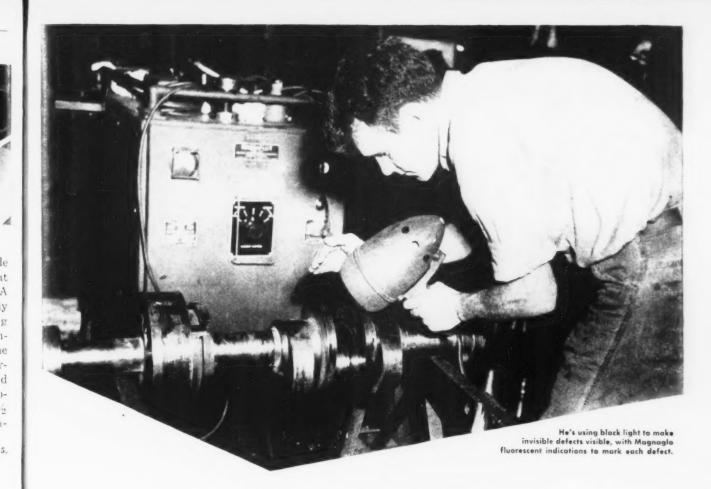
For more data circle No. 35 on postcard, p. 125,



Fan-cooled motors

Speed-Trols, variable speed electric power drives in the range of 20 to 25 hp with 2:1, 3:1, 4:1 speed variation are available in totally enclosed fan-cooled models. Dual cooling system provides highly efficient internal and external cooling. Air inside the motor is continuously circulated by the large diameter internal cooling fan through unobstructed air passages between the motor housing and stator, over the motor windings, and through openings in the rotor. Heat from every part of the motor is quickly transferred by the triple action of convection, conduction radiation. Sterling Electric Motors.

For more data circle No. 36 on postcard, p. 125.



He's Looking for Dollars—

and finding them!

HE'S finding dollars that are wasted when a machine breaks down . . . when its production stops . . . when AVOIDABLE EMERGENCY REPAIRS shoot costs sky-high.

His job is finding cracks and defects that are the cause of much equipment breakdown and many serious accidents. Because of his work, machines can be kept on the production line without costly interruption. He uses Magnaflux' equipment and methods.

Maintenance inspection with Magnaflux' Methods substitutes low cost prevention and correction for high cost repair and rebuilding. It is saving important money for countless cost-minded companies. They now consider it as essential as any routine lubrication.

One or another of Magnaflux' many inspection methods can reduce your operating cost through effective, PREVENTIVE maintenance. A Magnaflux engineer is ready to help you.

Meanwhile, mail the coupon for your copy of the new free bulletin, "Good Maintenance is Prevention - Not Repair."

Magnaflux' Inspection Methods detect the growing failure points in machines and equipment, before failure occurs



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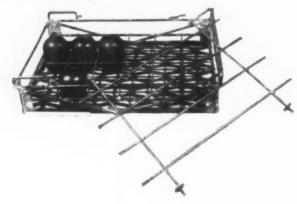
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Address_

ROLLICK FABRICATED ALLOYS

New Equipment For Processing

STEEL SHELL CASES



Before each draw in forming steel shell cases, the material goes thru a cycle of processes while contained in work holders. Details of processes and handling, however, will vary in different plants.

Rolock has built this Inconel fabricated-welded basket to handle the cup and first draw. (A deeper one handles the later draws.) Traveling on rolls and chains, now flat, again on end, suspended and tilted, always heavily loaded, the basket is designed to stand up under an unusual variety of conditions. The cases, separated by dividers, rest on the bottom. Handling two depths of cases, the retaining cover

fastens at two heights above bottom. Basket weight 110 lbs., load 290 lbs., ratio exceeds 2½ to 1. By using a high nickel alloy, true conservation of nickel is achieved in cycles of heat, quench, and acid.

This is but one example of Rolock special shell case equipment. Other types, as well as fixtures used before the cupping operation . . . and others used after the final draw, for washing and lacquering . . . have been designed. Ask us for details.



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IOR-ENGINEERED for better work Easier Operation, Lower Cost

18RL628

New Equipment

Continued



Elevating tail gates

Elevating tail gates with specially designed roller assemblies expedite transfer of heavy armament assemblies from cribs to airplane. The roller assembly on flat-bed trucks has been designed so that pallets can easily be lifted by hydraulic power and rolled from the lift gate onto the truck bed. Gar Wood Industries.

For more data circle No. 37 on postcard, p. 125.

Demineralizer

New, compact Mono-Column demineralizer features efficiencies of mixed bed ion exchange together with simple and speedy regeneration system. The unit requires only 2x2x71/2 ft of floor space, connection of influent to a plant's water system, and connection of effluent to those points where high purity water is required. Once the demineralizer is set in operation, production up to 100 gph of super high purity water is accomplished completely automatically and without the use of heat or steam power. Penfield Mfg. Co.

For more data circle No. 38 on postcard, p. 125.

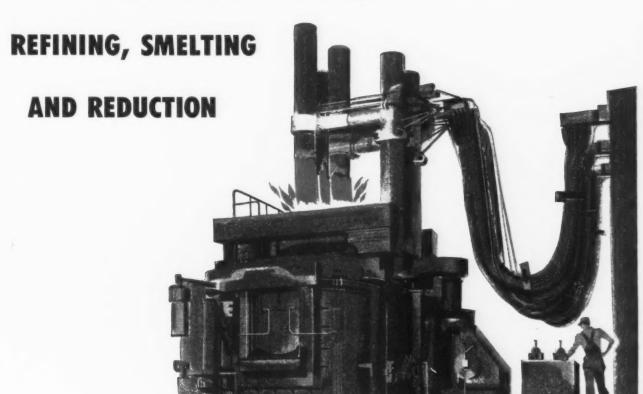
Paint spraying unit

Feature of new ionic-high potential paint spraying equipment is the ionic-gun. This new spraying unit is designed on a principle of charging the paint electrically within the spray apparatus itself. With the ionic-gun, paint is highly ionized so that it differentiates between painted and unpainted surfaces, producing an even finish and penetrating into all cavities and crevices. Less paint is used in actual operation and product quality is said to be increased. Scientific Electric.

For more data circle No. 39 on postcard, p. 125.

Lectromelt

FURNACES FOR MELTING,



35 years ago, the first Moore Rapid Lectromelt Furnace was put to work, setting the pace which established these furnaces as leaders in industry. Bold thinking throughout the years has maintained that position and, today, Lectromelt Furnaces are first choice internationally for all types of melting, refining, smelting and reduction.

From the automatic controls that guide the operation of a Lectromelt Furnace to its massive shell, Lectromelt Furnaces are built as production tools. Assembled and mechanically operated on the erection floor at Pittsburgh, they go together faster in your plant, and you get into production with minimum delay.

Lectromelt Furnaces offer you rapid top-charging, high-speed melting, accurate control of quality and low-cost operation. They give long, trouble-free service and correspondingly low upkeep costs. We sell mighty few replacement parts; evidence of their durability.

Catalog No. 8 describes iron and steel melting and refining work. For a free copy, write Pittsburgh Lectromelt Furnace Corporation, 312 32nd Street, Pittsburgh 30, Pennsylvania.

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MOORE RAPID WHEN YOU MELT ... LECTOMELL





HERE'S YOUR ANSWER!!

The Baush W-8 Drilling Machine illustrated is drilling 17 - 3/4 diameter holes, in one operation, in CAST STEEL.

Baush W-Type Drilling Machines

have always been known for their time-saving operation, rugged construction, and an ability to handle the heaviest jobs day-in and day-out — and do it for years with minimum maintenance.

Unit shown is equipped with a 30 H.P. Spindle Drive Motor, has a $24^{\prime\prime}$ x $30^{\prime\prime}$ rectangular, joint-driven type head with master-bored cluster plate that is bored for, and furnished with, $17-3^{\prime\prime}$ diameter slip-sleeve type spindles.

Part being drilled is loaded into work-holding pallet as shown in photo. Pallet is located and clamped in each machine proper, as a progressive sequence of operations is performed on this part while it travels through a battery of different units — of which the W-8 Unit shown is one.

BAUSH
MACHINE TOOL CO.
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Write, wire or 'phone your drilling problems to us.

the Iron Age

SALUTES

Francis O. Case

A long background of success fits him to lead Anaconda's entry into the aluminum field.



 ${f F}^{
m RANCIS}$ CASE is a chemical engineer who has risen to a top position in management. He is president of the newly organized Anaconda Aluminum Co.

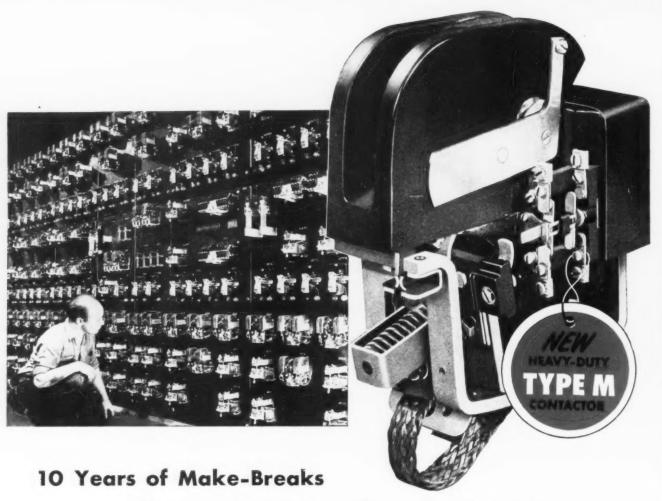
His new job is as challenging as it is exciting. The \$45-million project is being built near Columbia Falls, at the base of Teakettle Mountain, in Flathead County, Mont. Having decided to put part of their eggs in an aluminum basket, the directors of Anaconda have entrusted it to him in the faith that he won't stub his toe.

A long background of success fits him to lead Anaconda's entry into the burgeoning aluminum industry.

Sandwiched around World War I training as an aviator was experience with New Jersey Zinc Co. From 1920 to 1942 he served with International Smelting & Refining Co. in a variety of capacities including zinc oxide department, manager of pigment division, manager midwest district, and Anaconda sales. From 1942 to 1945 he was general manager of Basic Magnesium, Inc. In 1945 he became assistant to the president of Anaconda; in 1947, vice-president of Anaconda Wire & Cable Co.; and in 1948 vice-president of Anaconda Copper.

He is as cosmopolitan as they come. Born in Chattanooga and educated at Cornell, he has worked from New York City to Henderson, Nev., and back again. He looks toward Teakettle Mountain with neither smugness nor fear, but with confidence born of broad experience and enthusiasm which is indestructible.

When he has time he enjoys gardening and fishing near his Connecticut home.



Prove TYPE M Dependability

on Weirton Steel's Tin-Plate Line

If dependability and trouble-free operation interest you, here's a contactor worth knowing about. It's new—yet proved by ten years on-the-job testing.

Back in 1941, Westinghouse looked for the toughest applications to field test these contactors... picked locations for their severe duty. On numerous applications in five mills throughout the country, Type M Contactors went to work to prove themselves the most dependable yet developed.

One example was the first Tin-Plate Line constructed at Weirton Steel Co. Here, Type M's meet all Weirton's demands for dependability, low maintenance and long life. In fact, the successful operation justified using them in many other applications such as Shearing, Cleaning and other Plating Lines.

Millions of make-breaks proved the Type M dependability to Weirton Steel. You can prove it yourself. Ask your Westinghouse representative for full details on this contactor. Check the unit construction...unit mounted interlocks, "Qwik-Quench" arc box, and knife-edge bearings. Ask him today for a free copy of B-5261 and the complete Type M story. Or write Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pennsylvania.



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THE IRON AGE

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the Iron Age

INTRODUCES

Solomon R. Baker, elected president, PYRENE MFG. CO., Newark, New Jersey.

G. B. Moser, appointed president, Pittsburgh & Ohio Valley Railway, a subsidiary of PITTSBURGH COKE & CHEMICAL CO.; and James K. Moore, named superintendent.

Thomas T. Taylor, named executive vice-president, GEORGE D. ELLIS & SONS, INC., Philadelphia; William C. Coles, Jr., named vice-president in charge of operations, Myers Mfg. Div.; and L. Crampton Sossaman, named vice-president in charge of sales for the Myers Mfg. Div. also.

Edward P. Bolen. elected a vicepresident, NATIONAL AUTOMO-TIVE FIBRES, INC., Detroit.

Elmer W. Krueger, named vice-president, CLEVELAND PNEUMATIC TOOL CO., Cleveland.

A. O. Williams, appointed director of engineering, Industrial Truck Div., CLARK EQUIPMENT CO., Battle Creek, Mich.

Frank O. Riley, appointed director of Commercial Product Engineering, Ternstedt Div., GENERAL MOTORS CORP., Detroit.

K. M. Lyons, appointed director of sales, Container Div., JONES & LAUGHLIN STEEL CORP., Pittsburgh; G. Wesley Gates, named manager of drum sales. Mr. Lyons succeeds H. W. Lees, who has retired but will remain in a consulting capacity.

John Muchmore, named staff assistant to director of public and industrial relations, AIRESEARCH MFG. CO., Los Angeles.

Garth A. Abbott, joins the Engineering Physics and Special Devices Group, ARTHUR D. LITTLE. INC., Cambridge, Mass.

Charles W. Schreiber, appointed vice-president in charge of sales, YAWMAN & ERBE MFG. CO., Rochester; and David C. Borlen, elected to vice-president in charge of manufacturing.

J. A. Doolittle, promoted to an assistant to the manager of production. ALLEGHENY LUDLUM STEEL CORP., Pittsburgh offices, and Arthur H. Hanks, named manager, Watervliet, New York, plant.

Philip J. Clough, appointed assistant director of the Metallurgical Dept., NATIONAL RESEARCH CORP., Cambridge, Mass.

Gordon T. Grimstad, named assistant engineer, product design section, ALLIS-CHALMERS MFG. CO., Boston Works; and William E. Harper, named assistant engineer, also in the development section.

James H. Taylor, appointed chief electrical engineer, UNITED ENGINEERING & FOUNDRY CO., Pittsburgh. He succeeds Robert H. Ellis, who was named consultant electrical engineer.

O. J. Archer, named head of new Silver Spring, Md., office, ELECTRIC CONTROLLER & MFG. CO. of Cleveland

Howard S. Gier, appointed district manager in charge of Chicago warehouse, DUMAS STEEL CORP.

Irving August, appointed assistant to the works manager, Holyoke, Mass., plant, WORTHINGTON CORP.; and Merril Berman, appointed superintendent, Denver plant.



A. G. PATTERSON, elected president, Electric Controller & Mfg. Co., Cleveland.



PHILIP H. CLAPP, JR., appointed vice-president, Engineered Castings Div., American Brake Shoe Co., N. Y.



C. A. TAYLOR, elected a director, Copperweld Steel Co., Glassport. Pa.

GE





Permanent Mold Gray Iron Castings by DOSTAL offer many advantages. Their structure is uniform and surface scale is eliminated. These 2 factors permit higher speed machining with faster feeds. The dimensional accuracy and uniformity of DOSTAL Permanent Mold Castings reduces machining operations to a minimum. Permanent molded castings are uniform in hardness and their structure is dense and porous-free.

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DOSTAL

FOUNDRY and MACHINE COMPANY 2502 Williams Drive Box 180 Pontiac, Mich.

Personnel

Continued

Robert F. Tighe, appointed manager, Cleveland district sales office. KAISER ALUMINUM & CHEMICAL SALES, INC.

Dr. Glenn H. McIntyre, named technical director, FERRO CORP., Cleveland; Grville O. Kenworthy, appointed director of research; E. E. Bryant, appointed technical director, Porcelain Enamel Div.; and Grant E. Miller, director of enamel development.

George A. Park, appointed manage of distributor sales, NORTON CO., Worcester; Donald L. Price, named sales manager, eastern region.

George J. Matkov, appointed to newly-created position as manager of labor relations, THE MAYTAG CO., of Newton, Iowa.

F. P. Murken, appointed manager, Industrial Hose Div., QUAKER RUB-BER CORP., Div. of H. K. Porter Co., Inc., Philadelphia.

David Lewis, appointed sales manager, FRUEHAUF TRAILER CO.

Dr. E. I. Shobert, appointed manager of carbon research and engineering, STACKPOLE CARBON CO., St. Marys, Pa.; and Henry M. Dressel, will serve as director of research and engineering, Electronic Components Div.

R. L. Lloyd, appointed general manager of Advertising, THE INTERNATIONAL NICKEL CO., INC., New York, and R. A. Wheeler, appointed assistant general manager.

T. M. Girdler, Jr., appointed assistant manager of operations, Union Drawn Steel Div., REPUBLIC STEEL CORP., Massillon, Ohio; Horace B. Anderson, becomes superintendent, same division, Beaver Falls. Pa.; and Harry B. Matzen, Jr., becomes assistant superintendent at the Massillon plant.

W. B. Conrad, appointed sales representative, Michigan territory, THE POLYMER CORP. of Pennsylvania, Reading, Pa.

Frank W. Hogan, appointed assistant to the sales manager, ADAMAS CARBIDE CORP., Harrison, New Jersey.

Harold C. Smith, Jr., appointed manager, Rail & Government Sales, THE CARBORUNDUM CO., Niagara Falls, New York.



FRANK R. MILLIKEN, appointed a vice-president, Kennecott Copper Corp.



HARRY DAY, appointed vicepresident and general manager, Link Welder Corp., Detroit.



DR. DAVID B. PARKINSON, named production engineering manager, Brush Development Co., Cleveland.



M. R. STURDIVANT, appointed general superintendent, aircraft fabrication and machining, Kaiser-Frazer Corp., Willow Run, Mich.

Carburizing Method-93 & TOCCO Method-48 & Savings per pin 45 &

● When a leading motor truck manufacturer switched to TOCCO for surface hardening steering knuckle pins, they not only cut the cost of the part in half, but reduced heat-treating time from 17 hours to 48 seconds!

● Using TOCCO they were able to combine two operations and eliminate four others completely. Moreover, the TOCCO unit, being located right in the production line next to related operations, saves

approximately 4000' of hauling to and from the heat-treat department – an important economy factor not included in the above figures.

If your operations involve the hardening, brazing, soldering, melting or forging of ferrous or non-ferrous metals, TOCCO can probably speed up your production and lower your costs, too. Why not ask to have a TOCCO engineer survey your plant for similar cost-cutting results—without obligation.

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Faster assembly . . . no more failures of fasteners. GREER STOP NUTS hold firm against jolts, shocks, shimmy, wobbles . . . any vibration, any kind.



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GREER STOP NUT CO. 2620 Flournoy, Chicago 12, III.



Personnel.

Continued

H. L. Rittenhouse, appointed to newly created position of manager, Product Development and Engineering, THE EUCLID ROAD MACHIN-ERY CO., Cleveland; Carl Koenig was promoted to chief development engineer; Louis Held, promoted to chief product engineer.

Arthur L. Holmes, appointed sales representative, H. K. PORTER, INC., Somerville, Mass.

Bob Dando, transferred to the Philadelphia territory, STANDARD PRESSED STEEL CO. of Jenkintown, Pa.

R. H. Fitzsimmons, appointed district sales manager, Northern Ohio, McINNES STEEL CO., Corry, Pa.

Robert F. Costello, sales manager, Chicago branch, FRUEHAUF TRAILER CO., assigned to assist in setting up the Brazilian sales organization in Sao Paulo.

Robert Scott, appointed to the newly created post of assistant sales manager in charge of dealer relations, EVINRUDE MOTORS, Milwaukee.

John W. Brophy, appointed works manager, Cleveland Diesel Engine Div., GENERAL MOTORS CORP.

OBITUARIES

Joseph Minarik, 59, late president, Abart Gear & Machine Co., Chicago.

Walter Tetzlaff, 60, president, The Flour City Ornamental Iron Co., Minneapolis, recently.

William R. Culbertson, 62, vicepresident of Rust Furnace Co., Pittsburgh, recently after a long illness.

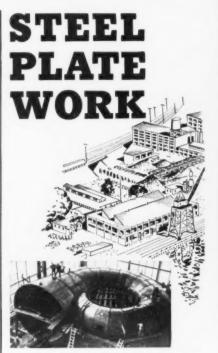
Frank Cordes, 82, former chairman and president of Blaw-Knox Co., at Blawnox, Pa., recently.

Irwin E. Sanger, assistant treasurer and purchasing agent, The Strong Steel Foundry Co., Buffalo, recently.

John M. Glasgow, manager of the land department, Tennessee Coal & Iron Div.. U. S. Steel, recently in Birmingham.

Harry D. Siegfried, 63, retired manager of sales, Steel Div., Henry Disston & Sons, Inc., Philadelphia, suddenly of a heart attack.

Charles A. Brizzolara, 59, works manager, Danly Machine Specialties, Inc., suddenly in his home at 924 Bonnie Brae Ave., Rivert Forest, Ill.



TURBINE CASINGS

and other heavy steel plate work are fabricated at Puseyjones of Hot-Rolled, High-Strength, Low-Alloy Steel.

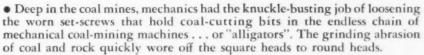
Every facility for large scale metal fabricating: - Heavy plate shop equipment - Rolls -Shears - Bending furnaces. Stress relieving furnace 33'x18'x16' up to 2100°F. Machine shop for facing, turning, and boring. 50 ton capacity gray iron foundry. Deepwater transportation on one side, the Pennsylvania RR on the other. Talk to our development engineers.

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PUSEYJONES



The Steel that took the cussing out of changing an "Alligator's" Teeth



The Bowdil Company makes most of the cutter chains used on leading makes of coal-mining machines. They asked Republic Steel for a solution to the problem of the round heads on the "alligator".

A Republic Field Metallurgist recommended that Bowdil switch to a Republic Carbon-corrected Cold Drawn Alloy Steel Bar for the set-screws. They did . . . and there's been less cussing in the coal mines . . . plus a great reduction in the amount of high-priced time wasted in trying to get a grip on worn set-screws.

Curbon-correction produces long-wearing qualities in the square alloy steel bars right out to the corners . . . prevents the corners of the stock from turning up soft while the center has the desired hardness.

May we tell you more about Republic Carbon-corrected Cold Drawn Alloy Steels? And how Republic Three-Dimension Metallurgical Service helps manufacturers work these steels into their production? A letter will bring the Republic Field Metallurgist to call.



Republic Carbon-corrected Cold Drawn Alloy Steels make the square heads of these set-screws tough right out to the corners to withstand wear longer without rounding off.

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the exact steel



is almost

this easy!

The age of push-button steelmaking has not yet arrived. But many a steel buyer has learned that a buzz to his secretary is the first step in making contact with a team of steel experts who can put their special knowledge and skills to work making the right steel to do the job. We have this team at Inland.



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Radioactive tracers Track Metal cleaner effectiveness



By J. W. Hensley

Manager, Nucleonics Laboratory Research and Development Div. Wyandotte Chemicals Corp. Wyandotte, Mich.

Cleaners used in metal finishing operations are growing in complexity and number. Looking for basic data on the metal cleaning operation and the effectiveness of cleaners, Wyandotte Chemical Corp. tagged a fatty acid type soil with radioactive tracers. Using a standardized procedure, researchers applied the tagged soil to prepared metal disks 1.5 in. in diam. Radioactivity was measured with a Geiger counter before and after cleaning. The method is sensitive, versatile. While still a laboratory research tool, indications are the method may eventually be adapted for shop use when data an shop variables are more complete.

Cleaning operations in the metal finishing industry become more and more complex as the variety of substances to be removed increases. Because of this, greater emphasis is being placed on field research. Such research, often involving reactions at surfaces or solid-liquid interfaces, is difficult because of the number of variables involved. Negligible quantities of materials concentrated on a surface or at an interface, can have an effect out of proportion to the quantity of material involved. An example occurs in electroplating where trace contaminants on the base metals may have a pronounced effect on results.

To measure such small quantities of materials, often immeasurable or even undetectable by conventional test methods, a new, sensitive, technique, for quantitative measurement of trace quantities of materials is of considerable interest. Radioactive tracers provide a technique capable of extreme sensitivity and quantitative measurements of trace quantities without the limitations and complications usually inherent in highly sensitive, quantitative methods. For sev-

"Soils most commonly encountered . . . are buffing compounds and cutting oils . . ."

eral years Wyandotte Chemicals Corp. has been working with radioactive tracers in various fields of detergency research.

Tracers are used to advantage in several ways. Cleaner components, normally alkalies and surfactants, are tagged by synthesized radioactive atoms and used to determine filming characteristics and adsorption on metal surfaces. Tagged solutions are used to measure the rate at which a cleaner component is rinsed from metal surfaces.

Metals are tagged (by bombarding in an atomic pile) and used to study corrosion, attack by cleaners, and the action of inhibitors in cleaners. Another application is in tests for evaluation of cleaning effectiveness using soils tagged with radioactive atoms. Here the radioactivity, which is proportional to the amount of tagged material present, is used to measure the removal of soil from a metal surface.

In devising a cleaning test using tracer methods, prime considerations are the choice of soil and the method for incorporating the radioactive tag. To have a valid tagged soil, radioactive

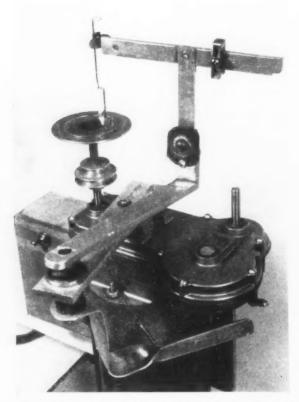


FIG. 1—A measured volume of radioactive stearic acid soil solution is spread over a metal disk automatically. Solvent is evaporated leaving a solid fatty acid film.

atoms must be incorporated in the molecules of the soil component to be studied. In the case of organic materials, the desired compounds must generally be synthesized with the incorporation of radioactive atoms.

Soils encountered in metal cleaning operations are almost infinite. The most suitable application of tracers seemed to be in connection with processes in which the last traces of soil must be removed for optimum results, as where metals are cleaned prior to electroplating. Soils most commonly encountered are materials applied to the metal in previous operations, such as buffing compounds and cutting oils. These soils frequently consist of combinations of hydrocarbons, including mineral oils and waxes, fatty acids and derivatives, tallow, vegetable oils, etc., and particulate matter, such as abrasives, metal, and carbon particles.

Fatty acids troublesome

Of these, fatty acids generally are considered troublesome. There have been no satisfactory quantitative methods for studying removal of residual films of fatty acids. Frequently present in buffing and compounds and polishing materials, their affinity for metals provides desirable characteristics, but also makes them difficult to remove. Fatty acid films may also be deposited on metals from preliminary soak cleaners containing soap. Such films must be removed by subsequent cleaning operations.

Radioactive fatty acids, synthesized with carbon-14. may be purchased from several sources, with authorization from the Atomic Energy Commission. Tagged stearic acid was chosen for first investigation. Soil types other than fatty acids are being investigated, but the bulk of the work so far has been done with tagged stearic acid, and this discussion will be limited to that soil.

Tagged stearic acid soil used

In most of the work, tagged stearic acid has been used alone as the soil. Some trials have been made with combinations of the stearic acid with various types of oil, in order to determine whether the presence of oil would have any pronounced effect on the removal of stearic acid in the cleaning process. Under the conditions investigated, removal characteristics of the stearic acid appear to be essentially the same whether used alone or combined with mineral oil. The metal cleaning test procedure using tagged stearic acid soil has been described in detail*.

Metal disks, 1.5 in. in diam, after preliminary cleaning with solvent, are machine abraded to provide a clean surface with a reproducible

^{*} J. W. Hensley, H. A. Skinner and H. R. Suter, "A Metal Cleaning Test Using Radioactive Stearic Acid as Soil," Special Technical Publications No. 115, pp. 18-32, American Society for Testing Materials, 1952.



FIG. 2—Measurement of radioactivity. Soiled steel disk is placed on sample support, which slides under the window of a Geiger tube, inside a lead shield.

finish. The tagged stearic acid soil is applied as a solution by the apparatus shown in Fig. 1.

Five microliters solution is spread in a thin, continuous film on the disk. After the solvent is evaporated, a thin film of stearic acid remains which is essentially uniform and highly reproducible. Radioactivity on the metal surface is measured with Geiger counting equipment shown in Fig. 2. This initial measurement or "count" on the soiled piece is merely a check, as a constant, known amount of stearic acid is applied. Initial count from one disk to another is essentially constant. The piece is then cleaned by a standardized procedure, rinsed, dried, and the final count taken.

Since radioactivity, stated as counts per minute, is proportional to quantity of stearic acid on the surface, the final count provides a relative evaluation of cleanliness, without converting counts per minute into weight of soil.

It should be appreciated, however, that counts per minute for a given quantity of radioactive material depends on location of activity with respect to the Geiger tube, Geiger tube characteristics and distribution of activity on the sample surface. Several counts on the same kind of radioactive substance are directly comparable only when taken under identical conditions.

Although simple in principle, this test method is so sensitive that slight variations in procedure can produce large variations in results. All variables must be standardized and carefully controlled. Especially critical is the surface finish of the metal to which the soil is applied. This factor has given more difficulty than any other in the development of this test method.

FIG. 3—Comparative rates of removal of tagged stearic acid soil from steel disks by anodic electrocleaning in sodium metasilicate and a compounded cleaner.

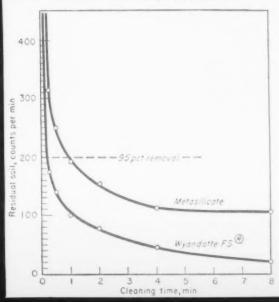
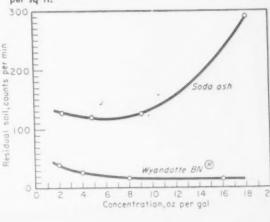


FIG. 4—Effect of concentration on removal of tagged soil from brass by soda ash and by a compounded cleaner, anodic electrocleaning for 1 min at 25 amp per sq ft.



"More than 2500 tests have been made with individual cleaner components . . ."

It has not yet been possible to obtain an entirely constant surface condition. Frequent checks with standard cleaning solutions selected as references are necessary.

Several variables involved in removal of this fatty acid type soil from steel and from brass by simple immersion cleaning and by electrocleaning procedures have been studied. More than 2500 tests have been made with individual cleaner components and compounded cleaners. Effects of concentration, cleaning time, current density and direction have been determined. Effects of surface finish and surface treatments on soil removal, and the removal of the soil during the rinsing and acid dipping processes have been determined.

Fig. 3 shows the rate of removal of the stearic acid in electrocleaning steel anodically in sodium metasilicate solution as compared with a compounded electrocleaner solution. The rate of soil removal by the compounded cleaner during the first minute is appreciably more rapid than by sodium metasilicate. After 8 min. cleaning, the compounded cleaner left 1/5 as much residual soil as the sodium metasilicate. The metasilicate (anydrous) and the compounded cleaner were used at concentrations of 8 oz per gal, both having approximately 3 pct titratable Na₂O in solution, with pH values between 13 and 14.

Rise in residual soil

Fig. 4 illustrates a type of study carried out with all the common alkalies, and with many compounded cleaners. Here, the effect of concentration was determined with constant cleaning time and current density. Base metal was brass. There is a pronounced rise in residual soil (or decrease in cleaning efficiency) as the soda ash concentration is increased above a certain optimum value.

Similar results are obtained with other com-

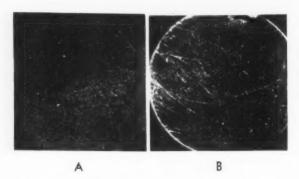


FIG. 5—Radioautographs of tagged stearic acid on steel test disks: (A) Residual soil on disk electrocleaned in soda ash solution: (B) stearic acid adsorbed on clean steel from a radioactive soap solution.

monly used alkalies, with a rise in residual soil at concentrations above 2 to 4 pct titratable Na₂O in solution. The effect is found in cleaning steel or brass, and is more pronounced in cathodic than in anodic electrocleaning. It is even more pronounced in simple immersion cleaning than in electrocleaning. In contrast, the compound cleaner shows no decline in cleaning effectiveness at concentrations up to 16 oz per gal.

Another way in which the radioactive tracer method can be used is shown in Fig. 5. Radioautographs of the tagged stearic acid soil on steel disks have been obtained by placing the surfaces of the disks in contact with no-screen X-ray film and exposing for several days. In A a soiled disk was electrocleaned in concentrated soda ash solution for a short period, leaving a high residual soil of about 600 counts per min. Soil removal is non-uniform, leaving a spotty appearance. The autograph of stearic acid adsorbed on the steel surface is shown in B. In this case, a clean steel disk, polished in the usual way, was immersed in a tagged soap solution (sodium stearate plus excess caustic) for ½ min at 90°, then rinsed thoroughly. The stearic acid (or stearate) has adsorbed in a non-uniform manner, indicating variations in the nature of the steel surface, even though the polished surface was considered uniform.

Not for routine use as yet

The tests supply research data and are not intended to provide a method for routine comparison and evaluation of commercial cleaners for practical use. Field performance of a metal cleaner often depends on factors, aside from completeness of removal of a specific soil, which must be taken into account in making an evaluation. The method does, however, provide a sensitive and versatile means for evaluating cleaning effectiveness. Any laboratory test method must be correlated with practical cleaning results under plant conditions before it can be considered reliable. With a semi-rough surface, it has been found difficult to remove all the stearic acid soil, even with prolonged electrocleaning.

Surface finish a factor

Absolute residual soil left by a given cleaner, as well as differences between cleaners, will depend on surface finish and other conditions selected for the laboratory test method. Significance of such results either on an absolute or relative basis must be determined by correlation with other types of laboratory tests and plant trials.

At present, tests are being made in which pieces carrying known amounts of soil, as determined by the tracer method, are electroplated, with subsequent measurement of the quality and adherence of the plate. This work will provide information on what constitutes a "clean" surface in a practical sense.

New automatic unit Makes drop forgings —IN MID AIR—

The automatic factory moves a step closer with disclosure of a new automatic impact forging machine. Gone is the jarring crash of the forging hammer; this unit is vibration free. It holds the stock in midair and strikes it horizontally from opposite directions, achieves remarkably high speed. One automobile manufacturer may use it to replace hammers.

Several years ago an inquisitive IRON AGE editor came upon a machine which literally forged steel in mid-air. It was operating under wraps at International Silver Co., Meriden, Conn., automatically forming stainless steel knife handles from round bar stock in a single blow. It was doing it at a 3000 per hr clip, twice the hammer forging rate.

The idea of holding a blank in mid-air and having two horizontal die-holders strike it simultaneously from opposite directions was a new approach to the forging problem. It is based on the law of physics which states that when two inelastic bodies of equal mass, traveling toward each other at like speeds collide, both bodies come to rest with a complete absorption of energy.

To the men at Chambersburg (Pa.) Engineering Co., this sounded fine, with a few exceptions: (1) How to be sure the two opposing pistons were released simultaneously and traveled exactly the same distance at the same speed so that they would always meet at the same central point? And (2), how to be sure the forging blank is held at this central point so that it is simultaneously struck by both dies?

There were several dozen other problems (heating, loading, cycling, lubricating, automation, etc.) but these two were critical if the new forging machine were to work.

After some 10 years they were solved by electronic control of air-operated horizontal pistons as to speed, position, force, etc., through the use of micro-switches, balancing valves, etc. Electric eyes check blank position; it must be right or there's no stroke.

War broke out in Korea just as Chambersburg engineers were ready to talk. An Air Force officer threw a handful of jet engine blades on the desk of company president, E. C. Clarke. Had he any ideas? He did, but from then until its first public demonstration late last month, the Impacter has been under wraps.

The Air Force wants production rates on jet blades kept secret. But there is a clue in the 50 per min rate on stainless knife handles (a cold operation on a single No. 6 Impacter). Here's another clue: Where one trimming press handled the output of two hammers, four trimmers are planned for one Impacter. And another may be needed.

The "Cecomatic Forging" units shown at Chambersburg late last month are of the type illustrated here. Each unit consists of two No. 6 Impacters and accompanying heating and feeding equipment. One of the machines will soon go to Packard Motor Car Co., the first of four headed for that company's jet blade forging plant. They will precision forge at least seven different blades for the General Electric J-47

"This is not a 'war baby' . . . It will be used for automotive and other civilian jobs . . . "

engine. Precision forging means that after this 2-stage impacting operation the blade requires only cold coining and polishing to complete the operation.

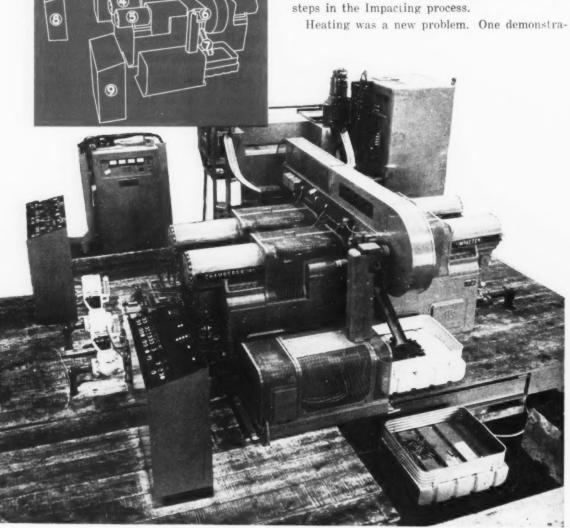
These units are not "war babies" destined for moth balls if jets are ever cut back. They will be used by Packard for many automobile parts (there are scores of possibilities) now made by

forging or extruding. Connecting rods will probably be the first.

Impacter sizes refer to ft-lb. A No. 4 unit. delivers a 400 ft-lb blow, a No. 15 delivers a 15,000 ft-lb blow. An Impacter (two are combined in a Cecomatic unit) is basically a horizontal frame carrying two air-operated impellers which move toward each other. Dies on the ends of the impellers close over the blank to forge it. Little is known about the behavior of the metal in forging, except that the process moves metal at a high velocity. Apparently this speed improves its physical properties, other theories to the contrary notwithstanding.

The instrumentation, conveyers and other materials handling equipment produce automation. Stock is thrown into a hopper at one end. Forged parts and scrap emerge separately at the other.

The blanks used by the Impacter are upset forged in an Omes machine (THE IRON AGE, Mar. 13, 1952, p. 100) and given a hammer blow for concentricity. The numbered illustration shows steps in the Impacting process.



CECOMATIC FORGING: (1) Automatic feed brings stock to heating element. (2) Stock is heated and released to chute. Temperature is checked and under heated stock rejected. (3) Chute delivers stock to transfer device, which loads the Cecomatic conveyer. (4) First Impacter rough

forges the stock. (5) Second Impacter finish forges the stock. (6) Cut-off trims forging from sprue. (7) Separate chutes discharge forging and sprue to tote boxes. (8) Shows control panels for individual impacters; (9) is control panel for complete Cecomatic Process.

tion unit showed how stock could be heated in a Selas gas furnace. The other used induction heat with coils and feed by Tocco. The Tocco unit uses 10,000-cycle heating to bring blanks up to forging temperature (2100°F). Inductor coils are laminated, a new angle.

After heating, stock goes down a chute past a Leeds & Northrup Rayotube which gives an almost instantaneous reading and rejects underheated stock.

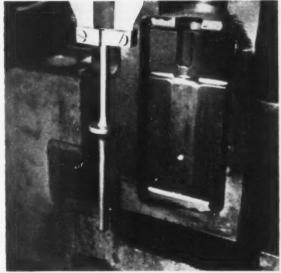
Why all the fuss? Of course, the Chambersburg people are glad to be helping speed jet blade production but they also see fascinating peacetime possibilities on items ranging from hydraulic valves to railroad car wheels.*

They list these advantages for Impacting:

- 1. Stock is worked equally from two opposing sides as contrasted with all other forging methods wherein the stock is worked from one side only. This means more uniform working of the metal.
- 2. Contact between the stock and the die occurs only when work is being done. Duration of contact is therefore greatly reduced in comparison with all other methods wherein the heated stock is in contact with at least one member of the dies for an extended period. This minimum die contact results in lower operating die temperatures and consequently longer die life. (On each stroke, dies are in contact for less than 1/3000 sec.)
- 3. Stock is moved faster and more efficiently. The energy of the impellers is almost completely absorbed, resulting in an appreciable increase in temperature of the stock. Advantage of this fact can be taken in processing through multiple stations without reheating.
- 4. Less energy is required compared with other forging processes to accomplish similar work in the Impacter, and there is no vibration.

In addition to the companies named, several other units are installed or on order, and civilian applications may have to take a back seat for a while. Thompson Products is experimentally cold coining jet blades. Besides the four units like that shown, Packard has a No. 15 unit on order for jet buckets. Oldsmobile, which will get the other No. 6 demonstration unit, will rough forge blades for the J-65 (Sapphire) engine. Induction Heating Corp. of America is supplying the automatic heating and handling equipment for the Olds unit.

Utica Drop Forge & Tool Corp. will get a unit consisting of two No. 4 Impacters. Curtiss-Wright is doing experimental work on a No. 4 Impacter.







KEY STEPS in process. Top to bottom, forging blank in position for first blow. In the center photo the first blow has been struck and the blank will automatically move to second Impacter. Last photo shows blank after it has received its second and final blow in the second Impacter. Note electric eye control for position of stock.

^{*}Chambersburg Engineers are familiar with the counter-blow vertical hammer, have sold their conventional drop hammers in competition with It in Europe. They say their impacter is entirely different.

Pressure Chamber Withstands 17,600 PSI

An all-welded pressure chamber, built for an internal working pressure of 10,000 psi, was tested and successfully withstood hydrostatic pressure of 17,600 psi. The 2 cylinder ends, with a wall thickness of 31/4 in., were machined from a single billet of SAE 4130 steel. Preheating, welding and stress relieving were done in a specially designed oven having a temperature range of 400 to 2200°F.

An all-welded pressure vessel, constructed for an internal pressure of 10,000 psi, was recently completed at Paramount Steel Corp., Long Beach, Cal. for the Astrophysics Laboratory of North American Aviation, Inc. Before delivery, this cylinder was hydrostatically tested to 17,600 psi. After these gigantic test pressures had been applied, X ray revealed no weld defects.

The 2 capsule-shaped halves of the cylinder were machined from a single billet of SAE 4130 steel. Each cylinder half was then end-bored to the proper ID. The interior of each bore was critically polished to specifications.

A J preparation, machined in each abutting cylinder half, formed a U joint when the cylinder halves were fitted together in the welding jig, Fig. 1. A precision-fitting backing ring bridged

the weld joint area. In final machining, cylinder ends were rounded off to remove excess metal

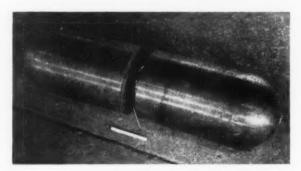


FIG. I—The pressure cylinder is tack welded, using local preheat, prior to placing it in a special preheating oven. Note the depth of the U joint.

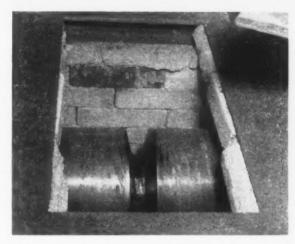


FIG. 2—View of cylinder after placement in the oven. A few weld passes have been made, each pass being wire brushed and carefully examined with a magnifying glass for defects before the next pass.

and facilitate subsequent heat treatment. Average cylinder wall thickness after boring and polishing was about $3\frac{1}{4}$ in.

A special oven was built to preheat the cylinder during welding, Fig. 2. Natural gas was used to provide temperatures from 400 to 2200°F, thus making it possible to stress relieve the cylinder without removing it from the oven.

An extension shaft from a welding positioner for rotating the cylinder was bushed, through the oven wall and connected to the cylinder end crandles. These cradles were set in special bearings to permit unrestricted expansion and contraction of the cylinder during welding and preheating-stress relieving cycles. A flat plate with a small square opening was mounted inside the oven above the cylinder to prevent radiant and convected heat from interfering with the welding operation, Fig. 3.

Due to the critical nature of this work, many tests preceded actual cylinder fabrication. A planned amount of billet stock was left over from which test samples were machined. The various chemical and physical tests made, totaling 32, included 20 pct elongation on 1-in. sq welded specimens, grain size determinations and tensile, yield and hardness tests. Each test had to meet the requirements of and be approved by North American Aviation, Inc., and the state of California.

As a further precaution, welders were carefully selected, certified and trained. Each had to be approved by both North American and the state. Before starting work, the men practiced for 24 hr under conditions simulating actual welding of the cylinder.

When work was started, the cylinder halves were mounted in the oven-contained end cradles, then preheated to 500 to 600°F. Welding continued at this preheat level. Each weld pass was wire-brushed and inspected with a magnifying glass immediately after it was completed. Any

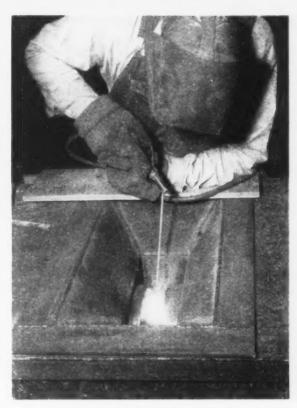


FIG. 3—Welding is done through an opening in the protection plate. It protects the welder from radiant and convected heat and prevents chilling of the cylinder which is kept at 500 to 600°F.

slight defect was chipped to sound metal and rewelded. Dy-Chek was used at frequent intervals to check for surface discontinuities not detected with a magnifying glass.

When about half the weld was completed, oven temperature was raised to 1050 to 1150°F for 4 hr to stress relieve the cylinder. Subsequent oven cooling to room temperature required 48 hr. The cylinder was then removed from the oven and X rayed but defects were revealed by this critical inspection. Therefore, the cylinder was reinserted in the oven, preheated and welding continued.

When welding was completed, the cylinder was again stress relieved for $4\frac{1}{2}$ hr at 1050 to 1150°F. Final oven cooling to room temperature required 65 hr. The cylinder was then hydrostatically pressure tested to 17,600 psi. This was followed by a complete X ray which again revealed no defects and required no reworking.

About 350 passes were made on the weldment, each pass being wire-brushed and glass-inspected before the next pass. The welding rod was Lincoln Planeweld No. 1, a high tensile alloy, of which about 100 lb varying from 3/32 to 5/31-in. diam were used.

SAE 4130 alloy was selected largely because it is a common aircraft structural alloy, which when all factors are carefully controlled, exhibits excellent weldability. It is also relatively easy to machine, thus its use expedited initial fabrication of the cylinder components.

Porcelain Enamels

SERVE AND SAVE FOR INDUSTRY



By W. A. Barrows President Barrows Porcelain Enamel Co. Cincinnati

Hundreds of different porcelain enamels now exist but new ones are being developed to meet new industrial requirements. Their resistance to acids, alkalis, water, weather, heat and thermal shock can reduce production costs substantially. By applying porcelain enamel to black steel pipe used for fluxing and degassing of aluminum, pipe life was increased by 12 to 20 times, saving more than 2 million lb in 18 months. Additional savings resulted from lower costs of handling, cutting, threading, storage and disposal of pipe. Contamination of the alloy, previously a problem, has been eliminated.

Important advances have been made in the development of porcelain enamel coatings for many new and varied industrial uses. Hundreds of different coatings are already in existence but new ones are being added continually to the long list.

In general, there are two groups of porcelain enamels and ceramic coatings: (1) regular, which can be used with solutions normally free from acids and alkalis and (2) acid resistant, which are resistant to most acids except hydrofluoric. The basic distinction between porcelain enamels and high-temperature ceramic coatings is their serviceable temperature range. Ordinary porcelain enamels are limited to sustained use at temperatures less than 1000°F. High-temperature ceramic coatings can be used at temperatures of 1600 to 1800°F for long periods of time.

Selection of a proper coating depends on its end use. Under certain operating conditions, selection of a proper base metal is of equal importance. Avid resistance, dielectric characteristics and resistance to thermal shock are other factors to consider in selecting a coating. Essential characteristics of some commercial grades of porcelain enamel coatings are given in Table I. The problems of selection can become involved. It is important, therefore, to consult with a manufacturer of porcelain enamels before making a selection.

It has been through a consultation with the

Barrows Porcelain Enamel Co. that the Reynolds Metals Co. has been able to increase the life of black steel pipe by 12 to 20 times, saving more than 2 million lb in 18 months.

Originally, black steel pipes used as chlorination tubes for fluxing and degassing aluminum lasted an average of 8 to 10 min. The cost of \$0.75 to \$1.50 per 6-ft length of 1-in. ID pipe was disproportionate to the overall operation. This cost did not include handling, cutting, threading, storage and disposal of the pipe. The short life of the pipe was attributed to: (1) the destructive power of the molten alloy and (2) deterioration by chlorine-supported combustion at high temperatures. Contamination of the alloy also occurred when black steel pipe and chlorine gas were combined at high temperatures.

Despite the destructive power of chlorine, it had to be used because the alloy was subjected to rigid specifications. Black steel pipe was the only practical metal for high-temperature fluxing operations. Therefore, the major objective was to extend the service life of the pipe and eliminate contamination of the alloy.

The application was not without problems. One of them was the actual coating of the pipes. Inasmuch as the 1½-in. ID pipes in some cases had a 14-ft length and about a 45° bend 24 in. from the exhaust end, interior coating was a major problem. The problem was solved when one end of the pipe was closed off, the slip

CHARACTERISTICS OF VARIOUS COMMERCIAL GRADE PORCELAIN ENAMEL COATINGS

Corrosion Resistance to Alkalis	Corrosion Resistance to Water	Corrosion Resistance to Acid	Heat Resistance	Thermal Shock* to Cold Water	Hardness	Weather Resistance
Poor	Fair	Poor	800°F	600°F	Fair	Poor
Good	Very Good	Good-Clase B	900°F	750°F	Good	Fair
Variable Poor to Good	Fair	Poor	900°F	450°F	Good	Peer to Geod
Good	Good	Good	650°F	500°F	Very Good**	Generally Very Good
Variable Poor to Good	Variable Fair to Good	Good	650 to 800°F	500 to 600°F	Good to Excellent***	Generally Very Good
Poor	Fair	Poor	1200°F	1000°F	Poor	Poor
Good	Very Good	Very Good	1700°F	1600°F	Good	Fair
Excellent	Excellent	Excellent	1700°F	1600°F	Excellent	Excellent
	Resistance to Alkalis Poor Good Variable Poor to Good Variable Poor to Good Poor Good	Resistance to Alkalis Poor Fair Good Very Good Variable Poor to Good Variable Poor to Good Variable Poor to Good Poor Fair Good Variable Poor to Good Poor Fair Good Very Good	Resistance to Alkalis Resistance to Alkalis Resistance to Alkalis Resistance to Acid Poor Fair Poor Good Very Good Good-Clase B Variable Poor to Good Good Variable Poor to Good Fair to Good Poor Fair Poor Good Very Good Very Good Very Good Very Good	Resistance to Alkalis	Resistance to Alkalis Resistance to Acid Resistance to Alkalis Resistance to Acid Resistance Shock* to Cold Water	Resistance to Alkalie Resistance Resistance

^{*} Depends somewhat on contour of surface,



FIG. I—Porcelain enamel coated pipe sectioned to show the exterior and interior coating. Used in an aluminum degassing operation, coated black steel pipe replaced uncoated pipe and increased its life by 12 to 20 times under conditions of high heat and corrosion.



FIG. 2—A cone shown in 2 parts, was made for use where high temperature, corrosion and thermal shock were problems. This cone is an example of the size of equipment that can be coated successfully.

allowed to fill the erect pipe and later run off slowly. The result was an almost perfect coating.

After the pipe was coated, it was fired at temperatures of 1300 to 1900°F. This initial coating supplied the bond between the metal and the several finish coats. Finish coats were applied in the same manner as the bonding coat.

After perfecting the coating method, another problem was that of choosing the best enamel within a proportionate cost range. This selection involved several factors, one of which was the uneven heating of the inside of the pipes during use. Chlorination tubes were immersed in a bath ranging from 1250 to 1350°F with surface temperatures frequently reaching 2000°F. Chlorine flow through the tube kept the part above the surface of the molten alloy cool enough to prevent softening of the coating. However, ceramic coatings under the flux line did become plastic resulting in rapid deterioration.

In tests, regular high-temperature resistant enamels failed to resist corrosion caused by molten aluminum. To defeat this problem, various refractory materials were added to high corrosion resistant coatings to increase their heat resistance. Also, some finishes with high heat resistance were altered to improve their corrosion resistance. Of the two approaches, the first was the better. The most suitable coating finally selected increased the service life of black steel pipes to 148 min. compared to an original life of 8 to 10 min. at a cost only 5 times that of uncoated pipe, Fig. 1.

Research and development have made porcelain enamels and ceramic coatings more useful to industry. Today, they are used for cylinder linings, exhaust systems, pump impellers and casings, exterior finishes, burners and many other applications, Fig. 2.

^{**} About 6 Moh's scale of hardness.

^{***} Better than plate glass.

ELECTROLYTIC GRINDING of carbides fully



By Dr. N. W. Thibault and



B. H. Anderson

Norton Co. Rescarch and Development Dept. Worcester, Mass.

Tests conducted at the Norton Co. indicate that diamond wheel grinding assisted by electrolysis is promising as a commercial method for sharpening single-point carbide tools. Commercially accepted rates of cut, as compared with vitrified bonded diamond wheels in conventional grinding, can be maintained with a diamond consumption which is only a fraction of that required in conventional grinding. There is some evidence of electrochemical erosion of the tool. Further studies are recommended.

The Research and Development Dept. of the Norton Co. has been engaged for many months in evaluating electrolytically-assisted diamond wheel grinding of cemented carbide, sometimes referred to as "Electrolytic Grinding." To limit the scope of the work, and because Government records indicated that the sharpening of single-point carbide tools "is the largest single consumer of diamond bort," experiments have been closely related to this operation.

Most single-point carbide tools are finish ground off-hand. However, to control precisely the amount and speed of traverse of work relative to wheel face, the contact pressure between wheel and work, and measure rate of cut readily and continuously, the diamond cup wheel was mounted on a Norton No. 2 Universal Tool and Cutter Grinder equipped with hydraulically operated table.

The carbide was mounted on a specially designed constant pressure device shown in Fig. 1. Lettering on Fig. 1 indicates the following: M, metal bonded diamond wheel; E, electrolyte feed tube; B, counterweighted beam, maintained horizontal; H, test piece holder; C, cemented carbide test piece; S, stand of constant pressure device; P, ball bearing pivot; T, machine table; W, weight for regulating pressure between wheel and work; D, dial indicator to maintain beam horizontal; I, infeed mechanism for determining rate of cut; R, beam rest for use when device not in operation; —, wheel negative in D. C. circuit; + work positive in D. C. circuit.

Rate of stock removal was measured continuously during grinding by manual operation of the infeed mechanism, I. noting the infeed in thousandths of an ipm required to maintain the beam in a horizontal position. This was determined

tested

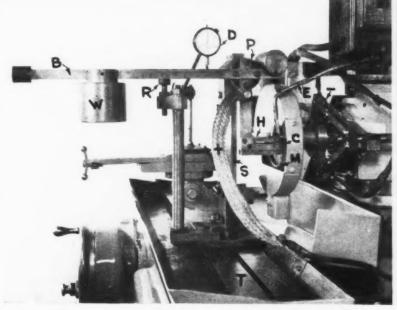


FIG. I—Constant pressure device set up on Norton tool and cutter grinder to simulate off hand grinding of cemented carbide cutting tools.

with the aid of a sensitive dial indicator which contacted the beam. This indicator was insulated electrically from the table of the machine. With metal bonded diamond wheels assisted by electrolysis, wheel wear was so small in relation to stock removal that it could be neglected in measuring rate of cut.

During most of the experiments, the electrolyte supply tube was flared, and a copious flow of liquid in a wide ribbon was directed to the wheel above the area of contact as illustrated in Fig. 1. In later experiments, the electrolyte was directed toward the center of the wheel from which position it moved across the wheel face in a thin film by centrifugal force.

The electric circuit employed was assembled from parts at hand, and was entirely satisfactory for test purposes. Current flowed from the positive terminal of a 24-cell Edison storage battery through the brass lever arm of the constant pressure device, Fig. 1, which was insulated from the base of the machine at the pivot bearing, through the carbide workpiece and electrolyte into the metal bonded diamond wheel, then through the copper ring attached to the spindle behind the wheel, through the brushes, a selective resistance of 0.33 to 1.33 ohms, and finally to the negative terminal of the battery which was charged by motor generator or arc welder.

In grinding experiments constants included a steel-cutting grade of cemented carbide, $\frac{3}{8}$ x $\frac{3}{4}$ in. section; wheel size; $6 \times \frac{5}{4} \times 1\frac{1}{4}$ in. $\frac{3}{4}$ in. rim, Norton type D6WHC; one inch traverse stroke across wheel face; 60 single traverse strokes per min.

Variables included; diamond wheel specifications, contact pressure, peripheral wheel speed, contact time, current density, grinding fluid or electrolyte, and method of applying the electrolyte.

Rates of cut and diamond usage are both extremely important factors to consider; the former because of its direct relationship to labor and overhead costs, and the latter because of its relation to tool cost and the need to conserve diamond.

Fig. 2 relates diamond usage and rate of cut for many of the wheels employed. After a diamond wheel has been freshly trued and dressed, the initial rate of cut and wheel wear will tend to be relatively high. Upon further use, this wheel may dull progressively and require periodic dressing to maintain a constant average rate of cut. On the other hand, the rate of cut

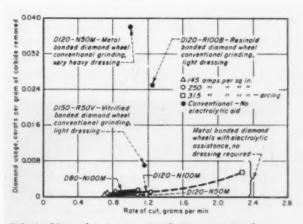


FIG. 2—Diamond usage v. rate of cut, conventional v. electrolytically-assisted diamond wheel grinding. Conditions: 70 lb psi; wheel speed 4000 sfpm; water soluble grinding fluid for conventional grinding; 5 pct NaCl, plus 14 pct rust inhibitor for electrolytic assistance.

"High diamond usage . . . in conventional grinding . . . due to the heavy dressing . . . With electrolytic assistance metal bonded diamond wheels . . . used only 7 to 21 pct as much diamond."

may fall off gradually to a constant rate which is maintained for long periods without the necessity for dressing. This was the case with all the metal bonded diamond wheels operated with electrolytic assistance under the conditions specified in Fig. 2. Values plotted have been derived from periods during which the average rate of cut remained essentially constant for several hours of actual contact time. If stick-dressing was required to maintain the specific rate of cut, any diamond loss due to such dressing was included in "diamond usage."

The primary standards for conventional grinding was the vitrified bonded diamond wheel, D150-R50V, a specification widely used for the off-hand sharpening of carbide tools. It was dressed lightly with a silicon carbide stick. Secondary standards included the resinoid and metal bonded diamond wheels of Fig. 2 dressed as required to maintain approximately the same rate of cut as the vitrified diamond wheel. The relatively high diamond usage for the metal bonded wheel in conventional grinding was undoubtedly due to the heavy dressing employed to maintain the relatively high rate of cut desired for comparison with the vitrified bonded wheel.

Low rate of wheel wear

With electrolytic assistance of 250 amps/sq in the three metal bonded diamond wheels cut at approximately the same rate as the vitrified bonded diamond wheel used conventionally, and at the same time used only 7 to 21 pct as much diamond. At 145 amps/sq in., diamond usage was equally low, but rate of cut was about 1/3 lower than at 250 amps/sq in. Because of the extremely low rate of wheel wear, and in spite of long runs, up to 6½ hrs actual contact time, more grinding would be required to establish

whether there was any significant difference in diamond usage between the three metal bonded wheels employed with electrolytic assistance.

In the table, costs to remove one cu in. of carbide have been calculated assuming labor plus overhead charges of both \$5 and \$7.50 per hr, and maximum quantity discounts in the case of the diamond wheels.

These comparisons indicate that, although appreciable savings were made in wheel costs by employing electrolytically-assisted diamond wheel grinding, overall cost savings were affected only when a rate of cut at least approaching that of the standard vitrified bonded diamond wheel could be maintained. This is due to high labor and overhead costs relative to wheel cost per unit of carbide removed.

Surface flat, moderately reflective

One series of runs was made at an average current density of 315 amps/sq in. during which time arcing could not be avoided. As indicated in Fig. 2, the rate of cut nearly doubled as compared with the same wheel operated at 250 amps/sq in. Wheel wear increased considerably but was no higher than that of the standard vitrified diamond wheel in conventional grinding. In actual practice, there is considerable doubt that arcing could be controlled well enough to insure low diamond consumption, and little or no damage to the carbide.

The vitrified bonded diamond wheel produced surfaces which were flat and moderately reflective, showing a typical abrasive scratch pattern and a Profilometer reading of 5 to 7 microinches. Edges were relatively sharp, with no evidence of cracking or chipping of the carbide.

Metal bonded wheels operated with electrolytic assistance produced surfaces which were entirely



FIG. 3—Maximum erosion of upper tool face at cutting edge, 100x, caused by electrochemical attack at the end of four min. Current density was 260 amp per sq in. Contact pressure and electrolyte the same as in Fig. 2.

CARBIDE REMOVAL COST-ONE CU. IN.

				Range of Labor Plus Overhead Costs at		Range of Total Grinding Costs for	
Wheels (all 1/8 in. diamond depth)	Current Density (amps/ sq. in.)	Contact Time (Min.)	Range of Wheel Costs	\$5 per hr.	\$7.50 per hr.	\$5 per hr.	\$7.50 per hr.
D80-N100M D120-N50M D120-N100M	} 250 {	155 to 178	\$0.40 to 0.95	\$12.90 to 14.80	\$19.35 to 22.20	\$13.30 to 15.75	\$19.75 to 23.15
D80-N100M D120-N50M D120-N100M	145 {	233 to 270	0.25 to 0.60	19.50 to 22.50	29.20 to 33.70	19.75 to 23.10	29.45 to 34.30
D150-R50V	0	165	5.65	13.75	20.60	19.40	26.25

mat at current densities of 140 to 315 amps/sq in. and more reflective with slight evidence of an abrasive scratch pattern at lower current densities Profilometer readings varied from 5 to 6 microinches at 80 amps/sq in. up to 9 to 12 microinches at 250 amps/sq in. No chipping or cracking of the carbide was observed.

While one surface of the carbide blank was being ground with electrolytic assistance, however, adjacent surfaces near the intersection were almost always attacked to some degree by electrochemical action unless protected by a nonconducting coating. This was particularly true of the upper face which was bathed with a copicus flow of fluid when the electrolyte was introduced above the tool as shown in Fig. 1.

With this method of applying the electrolyte and under the conditions of operations specified in connection with Fig. 2, the degree of attack on the upper face varied with current density. At 80 amps/sq in., no effect was noted even after many minutes of contact time. Above this current density, however, the higher the amperage, the greater the attack on the upper surface near its contact with the grinding wheel.

Electrochemically eroded

Under similar operating conditions, the longer the contact time at high current densities, the greater the attack. Fig. 3 photographed at a magnification of 100, illustrates the amount of erosion which took place in 4 min contact time at a current density of 250 amps/sq in. The upper edge of the carbide blank was electrochemically eroded for a distance of about 0.006 in. measured along the vertical surface being ground, and 0.024 in. measured along the upper surface, see Fig. 3.

Very low contact pressures fail

Much less edge erosion resulted when the electrolyte stream was directed toward the center of the cup wheel inside the diamond zone, from which position it moved by centrifugal force over the wheel face in a thin sheet.

Attempts to grind carbide with electrolytic assistance at very low contact pressures, $8\frac{1}{2}$ lbs/sq in. were not successful. The rate of cut was extremely low and edge erosion very pronounced.

Although modification of surfaces and edges brought about by electrolytic assistance to diamond wheel grinding has thus been demonstrated under certain circumstances, the practical effect on the performance and life of the carbide tools so ground, has not yet been commercially established. Preliminary comparisons of tools ground conventionally with a vitrified bonded diamond wheel and with electrolytic assistance using a metal bonded diamond wheel showed no apparent difference in tool performance of life on cast iron and steel cutting jobs. More comparative tests of this nature need to be made before final conclusions can be reached.

Edge erosion of the type illustrated by Fig. 3 may be reduced or even eliminated by coating adjacent surfaces with a non-conductive protective film. A wide variety of such coatings were tested. Best results were obtained by using liquid shellac followed by a low temperature bake, or by applying stick shellac to a heated carbide surface subsequently cooled to room temperature. The extra cost is an objection to the use of such protective coatings.

The use of "N" grade sodium silicate diluted 1:1 with water as an electrolyte in electrolytically-assisted diamond wheel grinding resulted in a material decrease in edge erosion as compared with that illustrated by Fig. 3 due to a protective coating which formed on adjacent surfaces. However, rates of cut were only approximately 2/3 those obtained with the electrolytes previously mentioned, and a coating difficult to remove after having once dried out was formed on machine parts contacted by this electrolyte.

Rust inhibitor added

Experiments indicated that electrolytes containing sodium chloride presented a decided problem with regard to rusting of machine parts and carbide tool shanks. Addition of a rust inhibitor to a solution of sodium chloride was an improvement. More recently it was found that a 5 pct solution of rust inhibitor is an equally efficient electrolyte which presents no rusting problem. No irritation to skin or nasal passages has been noted with this electrolyte in the concentration used.

A metal wheel containing no abrasive and metal bonded wheels with silicon carbide and fused alumina grain substitutes for diamonds were also tested. Results were unsatisfactory because of rough nd irregular surface finish, high-edge erosion and low rate of stock removal.

Measurements and calculations made on wheels operated under stable conditions indicated a net spindle power of 440 watts drawn by the vitrified bonded diamond wheel in conventional grinding. The 50 concentration metal bonded wheel operating with electrolytic assistance of 250 amps/sq in. and cutting almost as rapidly required only 125 watts net spindle power, or only 1/3 as much. However, 514 watts was used for electrolytic assistance at the gap, resulting in the higher total net power of 639 watts, or nearly $1\frac{1}{2}$ times as much.

As a result of these experiments, it is felt that diamond wheel grinding assisted by electrolysis is promising as a commercial method of sharpening single-point carbide tools and conserving diamond bort. However, until additional tests have been made, field experience gained, and other aspects of electrolytically-assisted diamond wheel grinding have been investigated more thoroughly no unqualified recommendation can be given the method for the commercial sharpening of single-point carbide tools.

Titanium can be case hardened

by nitriding



By Edmond J. Silk Head, Metallurgy Dept. Sam Tour & Co., Inc. New York

For greater utility titanium will have to be surface hardened. Research on nitriding of titanium is being sponsored by Ordnance Corps. Working with pure titanium and titanium alloys in sheet and slab form, Sam Tour & Co., Inc. has established hardness gradients under varying conditions. With RC-55 titanium, maximum hardness was obtained after 16 hr at 1600°F in ammonia. Highest surface hardness, Vickers 1098, was developed in L431 alloy treated at 1600°F for 64 hr. Tank nitrogen gave equivalent surface hardnesses but treating temperature must be at least 1800°F. Depth of case runs to 0.003 in. max.

or maximum utility, it will be necessary to develop some method of surface hardening titanium. For this reason Ordnance Corps through Watertown Arsenal has sponsored various research in the attempt to find the best and easiest method. Nitriding, so successful on steel, was thought worthy of investigation and Sam Tour & Co., Inc. was given the project.

The work was carried out exclusively on small specimens prepared from a sheet of RC-55 supplied by Rem Cru, and from slabs of titanium alloy supplied by the Titanium Corp. of America, and a bar each of three different alloys supplied by the Mallory Sharon Co. The nominal compositions of these metals are shown in Table I.

The size of the specimens used for the preliminary experimentation was dictated largely by the form and shape of the available material. For the RC-55 material, the specimens were approximately ¼ in. x ¼ in. x 1/16 in. and for the "A" and L-431 titanium alloy, the specimens were approximately ¼ in. cubes. Small tensile test bars were made from the bars of Mallory Sharon alloys.

All specimens were weighed to the nearest

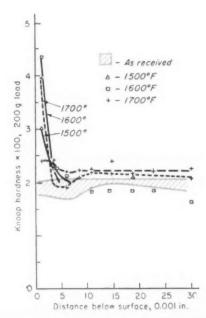


FIG. I—Hardness gradients developed in RC-55 titanium by treating in an atmosphere of ammonia for 3 hr.

0.0001 mg before and after nitriding. Specimens were treated in ammonia for 3, 16 and 64 hr from $900^{\circ}F$ to $1700^{\circ}F$ at 100° intervals.

The actual procedure was to place an alundum boat, containing both the RC-55 and "A" specimens, in the cold inlet end of the treating chamber, flushing the chamber with ammonia and bringing the furnace to the desired temperature. When temperature equilibrium was reached, the boat was drawn into the hot zone (by means of a nickel wire) directly under the thermocouple where it remained for the predetermined time. At the end of the run, the boat containing the specimens was drawn into the relatively cool exhaust end of the treating chamber, the furnace shut off and the specimens allowed to cool down to approximately room temperature under a continuous ammonia atmosphere.

During the early stages, attempts were made to carry out the nitriding treatment under conditions which would result in about 30 pct ammonia dissociation. However, in the lower temperature ranges, only 2.9 pct dissociation was found when an ammonia flow of 0.06 cfm was used. Subsequent check runs indicated that no significant changes could be attributed to changes in the degree of dissociation. Treatments, at higher temperature, were controlled to yield dissociation ranging from 30 to 60 pct.

The hardness gradients, developed in the RC-55 alloy under different treating conditions, are shown in Figs. 1 to 3 inclusive.

The curves have been idealized to a moderate extent because of the great scatter encountered in the subsurface regions. To simplify the representation, only those points which were above the original hardness of the material were connected by curves. Considerable scatter was en-

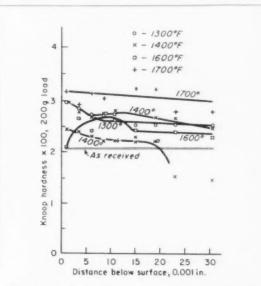


FIG. 3—RC-55 titanium hardness gradients developed by treating in an atmosphere of ammonia for 64 hr.

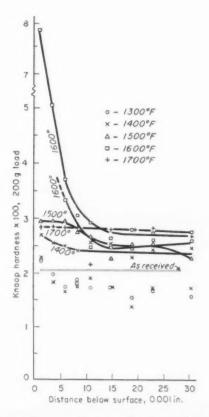


FIG. 2—Hardness gradients developed in RC-55 titanium by treating in an atmosphere of ammonia for 16 hr.

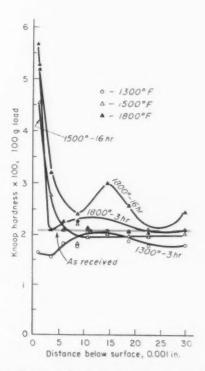


FIG. 4—Gradients developed in RC-55 titanium treated in a nitrogen atmosphere for periods indicated.

"At 1200°F . . . there was general softening . . . Maximum hardness is obtained at 1600°F . . . "

countered in the as received condition, particularly in alloy "A."

Titanium RC-55, when treated below a temperature of 1400°F, shows little significant increase in surface hardness for any given time of treatment in ammonia. Actually, at 1200° and 1300° there was a general softening effect. Maximum hardness is obtained at 1600°F at 16 hr; if the time of treatment is extended to 64 hr, there is a comparatively drastic decrease in the hardness level which can be obtained at any temperature.

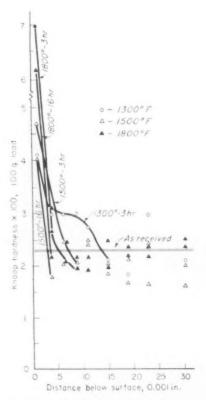
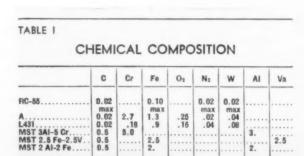


FIG. 5—Hardness gradients developed in titanium alloy "A" treated in nitrogen atmosphere for periods indicated.



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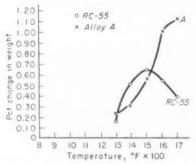


FIG. 6—Weight changes of specimens as the result of treatment in ammonia for 64 hr at indicated temperatures.

Titanium alloy "A" reacted similarly in the 3 and 16 hr runs, but did not show any significant changes at 1600°-1700°F when the treating time was extended to 64 hr. Again, 16 hr and 1600°F appears to yield the maximum surface hardness.

The highest surface hardness developed was Vickers 1098, obtained with the alloy L431 at a temperature of 1600°F and a treating time of 64 hr. Number of tests on this particular alloy was limited, but the general trend again indicates that 1600°F is the optimum temperature.

Using tank nitrogen, surface hardnesses, comparable to those obtained with ammonia, were developed at 1500° and 1800°F. For titanium RC-55, a 3 hr treatment at 1800° produced the maximum surface hardening, and for the titanium alloy "A," a 16 hr treatment at 1800° produced the highest surface hardness. These results are shown in Figs. 4 and 5.

Weight determinations, before and after treatment, indicate a pattern of losses and gains dependent on time and temperature. A summary of the weight changes observed are shown graphically in Fig. 6. Weight losses were detected only when the duration of the treatment was limited to 3 hr and then, only in the presence of ammonia.

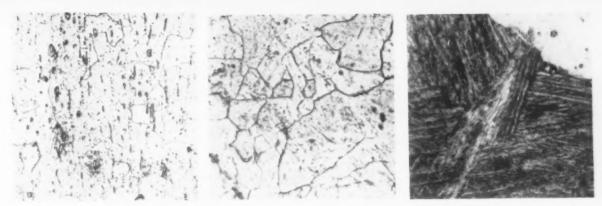
Some trends between weight change and hardness are indicated, but the data is too limited to yield conclusive opinions. However, RC-55 titanium, when treated at 1600°-1700°F for 64 hr, showed a marked reduction in hardness whereas alloy "A" did not. Coincidentally, Fig. 6 indicates that RC-55 began to lose weight at 1600°-1700°F and alloy "A" did not.

To illustrate the character of the case and the

TABLE II HARDNESS OF NITRIDE CASE Knoop Hardness Scale

Depth, in inches	0.0012	0.0036	0.0060	0.0084	0.0108	0.0148	0.0188	0.0229
MST 3 Al-5 Cr	506	438	470	451	438	470	506	454
MST 2.5 Fe-2.5 V.	644	618	592	488	488	336	382	363
MST 2 Al-2 Fe	672	382	382	382	488	423	423	488

The as received hardness averaged KHN 409 for 3 AI-5 Cr, KHN 436 for 2.5 Fe-2.5 V and KHN 436 for 2 AI-2 Fe.



FIGS. 7, 8, 9,—Microstructure of alloys as received. RC-55, left; alloy "A", center; alloy L 431, right. Etch: Water solution, 4 pct HF, 12 pct HNO₃, 250X.

resulting changes to the base microstructure of the titanium alloys used, selected photomicrographs are included, Figs. 7 to 13. The magnification of all photomicrographs is 250X. The case depths, as they appeared metallographically, in general, were quite shallow. None were much over 0.003 in. The etch used in all cases was a water solution containing 4 pct HF and 12 pct HNO₃.

During this entire investigation, particular attention was paid to the case brittleness and adherence. Most of the qualitative observations were made during specimen preparation. No flaking or spalling of the surface of the specimen during cutting or grinding was observed. All specimens, particularly those treated at and above 1300°F, assumed a color varying from salmon to

a reddish pink. Several specimens, when treated below $1300^{\circ}\mathrm{F}$, assumed a blue-violet surface coloration.

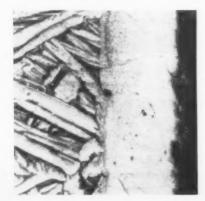
From the bar stock about $\frac{5}{8}$ in. in diam from the Mallory-Sharon Titanium Corp. it was possible to make some tensile test bars. Duplicate 0.3 in diam test bars were machined with threaded ends and a 2-in. gage section. One test bar of each alloy was treated in ammonia for 30 hr at 1600° F; the duplicate bar was left in the as received condition. Figs. 14 to 16 show the cases produced. Knoop hardness determinations, using a 100g load, indicated the hardness gradient shown in Table II had been produced.

As treated, the bars warped considerably, and all fractures occurred in the threaded sections within the grips. Close examination of the frac-



FIGS. 10, 11—Surface conditions after treatment in an ammonia atmosphere for 3 hr at 1600°F: RC-55, left; alloy "A", right. Etch: Water solution, 4 pct HF, 12 pct HNO₂. 250 X.





FIGS. 12, 13—Surface conditions after treatment in an ammonia atmosphere for 16 hr at 1600°F: RC-55, left; alloy "A", right. Etch: Water solution, 4 pct HF, 12 pct HNO:...250 X.



"With increased time and temperature there is an increase in . . . transformed beta . . ."

tures and the immediate vicinity failed to reveal any spalling or flaking of the salmon colored surface. Because of the manner in which the test bars failed, comparative physical data were not obtained.

Though this preliminary investigation has been made on a series of alloys whose uniformity is questionable, several facts have been established. The first is that commercially pure titanium such as RC-55, a ferrochromium titanium alloy such as "A" and a ferrotitanium alloy such as L431 react favorable to the nitriding treatment in ammonia at a temperature of $1600^{\circ}F$. Below this temperature, the results are erratic. The maximum hardness attainable with RC-55 is reached in a 16 hr treatment. Prolonging the treatment lowers the hardness. The ferrochromium alloy "A" and the ferroalloy L431 also react best at a nitriding temperature of $1600^{\circ}F$.

Prolonging the time beyond 16 hr at 1700° does not decrease the hardness of the ferrochrome alloy "A" appreciably. At 1600°F, a drop of about 100 KHN was experienced. With the ferroalloy L431, a 64 hr treatment at 1600° produced the highest surface hardness obtained to date, 1098 KHN.

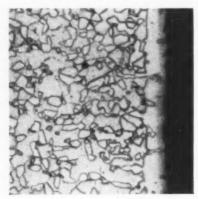
The use of tank nitrogen has indicated that a surface hardness, at least equivalent to those obtained by nitriding in ammonia, can be obtained, but the treating temperature must be at least 1800°F. The depth of hardening is, in general, shallower.

If the rough tensile tests are any criterion, the titanium alloys MST 3Al-5Cr, MST 2.5Fe-2.5V and MST 2Al-2Fe were made notch sensitive by the treatment.

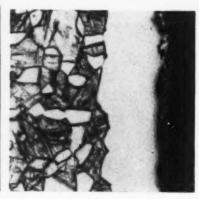
With increased time and temperature, there is an increase in the amount of transformed beta in the RC-55 titanium, and in general, greater coarsening of the structure as compared with the higher strength titanium alloys. Increased surface hardness is generally accompanied by the formation of a white layer which is probably a solution of nitrogen in alpha titanium.

A duplex layer is occasionally detected but disappears with prolonged treatment. It is possible that the initial solution of nitrogen in alpha titanium behaves as a barrier, slowing down further diffusion and possibly promoting the formation of a titanium nitride at the surface. With added time at temperature, more titanium nitride is formed. The exact nature of these layers is being investigated by X-ray diffraction.

The possibility that oxygen, in either the tank nitrogen or ammonia, played a significant role in the surface hardening process, has not been considered. However, to discount this possibility with complete certainty, future runs will be made in which trace oxygen will be removed from the gases.







FIGS. 14, 15, 16—Surface conditions produced in titanium alloys treated in an ammonia atmosphere for 30 hr at 1600°F. Alloy MST 2Al-2Fe, left; alloy MST 2.5 Fe-2.5V center; alloy MST 3 Al-5 Cr, right. Etch: Water solution, 4 pct HF, 12 pct HNO₃. 250 X.

NEW BOOKS

"Atomic Power," by V. H. Whitney and W. Isard. What effect will the harnessing of nuclear energy to produce power have on established industry? Drs. Whitney and Isard's analysis of social and economic factors involved in industrial location and regional development attempts to answer some questions the nation faces. Atomic power, under certain conditions, probably will compete with other sources of

power. They analyze the potentialities of this new energy source for industrial location, costs and processes. They test their theses in terms

"Encyclopaedia of Oxy-Acetylene Welding," by L. J. Tibbenhand. A short, concise encyclopedia on oxy-acetylene welding and factors affecting the process. British Book Centre, Inc., 122 East 55th St., New York 22. \$2.50, 73 p.



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Technical Briefs

Engineering

CORROSION:

Rotogenerated signal shown on oscilloscope in study method.

A new technique for observing corrosion of metals under controlled conditions are possible with a rotogenerative device recently described by J. B. McAndrew, metallurgist of the Armour Research Foundation of Illinois Institute of Technology.

Since the corrosion process is usually slow, it is desirable to use dynamic measurements rather than wait and observe conditions at an advanced stage of attack. This is best done by observing minute electric currents which flow in the electrolyte of a corroding solution. These currents usually have a direct quantitative relation to corrosive attack.

Current — Previous measuring methods have been limited and time consuming. The new method uses the dc corrosion currents to generate alternating current potentials. This is done by introducing a parameter of motion at a constant speed between a reference electrode and the metal specimen. The cylindrical specimen is

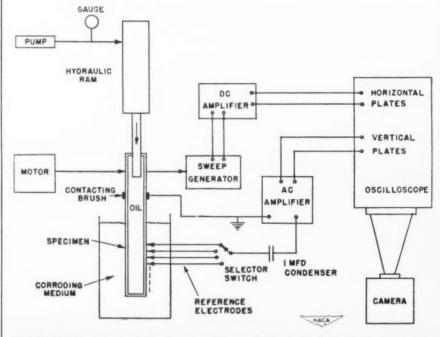
IF YOU WANT

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rotated in close proximity to the reference electrode.

When this is done, the potential fields set up in the electrolyte by the corrosion currents rotate with the specimen, and the electrode passes through continuously varying potential fields. This varying potential may then be regarded as an ac signal of complex wave form. It can be amplified and presented on an oscilloscope.

Rate—Changes in over-all corrosion, being relatively slow, are not amplified by the ac instruments. No significant polarization occurs at the reference electrode, so that it can simply be the exposed end of a small wire—silver, platinum, or another metal that is not attacked by the solution used.



SCHEMATIC layout of rotogenerative apparatus used in study of stress corrosion. Specimen here was thin-walled cylinder stressed by application of pressure internally.

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Higher efficiency with less fuel per kw-hr with new unit.

A turbine which will operate with the highest steam temperature ever used in a turbine-generator unit is now in production at General Electric Turbine Div.

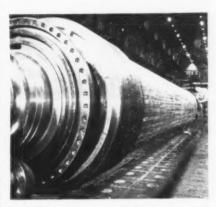
The new turbine, operating at an initial temperature of 1100°F, will be used in a turbine-generator unit for the Kearny generating station of the Public Service Electric & Gas Co., Newark, N. J. The 145,000-kw unit is the first of two for the New Jersey concern which will be placed in operation in the near future.

Less Fuel—Primary objective of turbine design is to improve turbine-generator efficiency so that electric companies can burn less fuel per kw-hr of electricity. Higher steam temperature is one means of achieving this objective.

Previous highest temperature used in steam turbine generators was 1050°F.

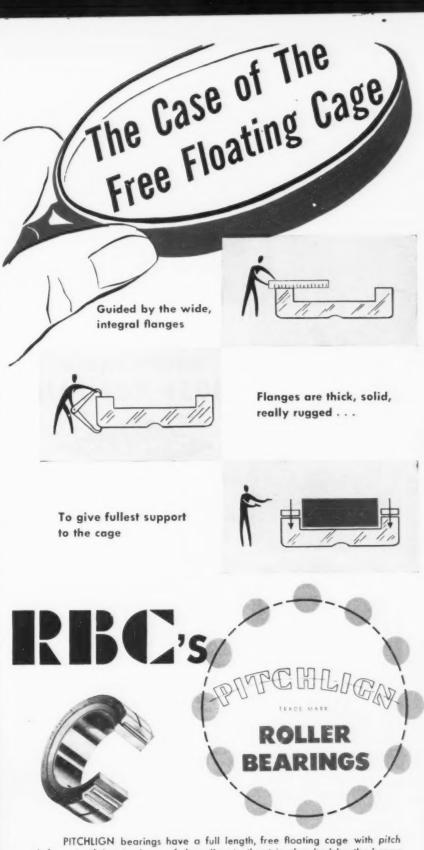
Stainless—A design feature of the Kearny machine is the use in the inner shells of stainless steel, which is necessary because of the high temperature.

This unit is one of the first 3600-rpm machines generating electricity at 20,000 v. Boiler for the turbine will employ coal, oil or gas, or a combination of these as fuel.



HIGHEST steam temperatures ever used will turn this 32-ft, 100,000-lb rotor at generating station of Public Service Electric & Gas Co.

(Turn Page)



PITCHLIGN bearings have a full length, free floating cage with pitch circle contact! Any tendency of the rollers to thrust is absorbed by the heavy integral flanges of the outer race. Completely relieved of this burden, the cage cannot distort and so fail in its vital duty of roller alignment. This is the one positive method of doing away with cocking and skewing. Only PITCHLIGN has it!

PITCHLIGN performs where others fail . . . interchangeable with precision needle bearings, of course. Get the facts!

RRC

Write for Bulletin SF-366

ROLLER BEARING COMPANY OF AMERICA . TRENTON, N. J.





A huge kingpin is tested for flaws through its entire length.



Reflectoscope testing this steering gear will reveal any hidden defects in the metal or in the weld where the two ends are joined.

REFLECTOSCOPE PROVIDES FAST, DEPENDABLE 100% TESTING

AUTOMOTIVE INDUSTRY: A dangerous accident caused by the failure of an important part would seriously damage the reputation of an automobile manufacturer. For this reason, the Molloy Manufacturing Company of Detroit — producers of COLD FORGED steel transmission shafts for two major automobile corporations — rely on Sperry Reflectoscope testing to eliminate the possibility of hidden defects in their product.

HEAVY CONSTRUCTION EQUIPMENT: The "Tournarocker", manufactured by R. G. LeTourneau, Inc. of Peoria, is a powerful, high-speed, materials-handling machine that can carry 18 tons fully loaded. Capable of traveling at 35 m.p.h., it is extensively used wherever huge amounts of material must be moved. As any parts failure on-the-job would, obviously, be dangerous and cause costly delays, the Le Tourneau Company looks to Sperry Reflectoscope testing to assure that nothing but defect-free axles, gears and kingpins are incorporated in the "Tournarocker".

Learn how you can reduce testing costs and improve quality control in your plant. Write today for complete information about the Sperry Reflectoscope . . . for sale, or for lease. Ask about Sperry's day to day Testing Service.



SPERRY PRODUCTS INC.

311 SHELTER ROCK ROAD

Danbury, Connecticut

REPRESENTATIVES IN PRINCIPAL CITIES

Technical Briefs

WELDING:

Production assembly without removal of grease film reported.

Welding without removal of grease film, on an assembly production basis, is reported to have been successfully accomplished at General Air Conditioning Corp., Los Angeles, Calif. The firm makes a combination kitchen range, sink and refrigerator.

Problem in this production assembly setup was to weld the stainless steel sink to the enameling iron. Removal of the grease film was costly, yet without removal, pit holes showed in the welds and this entailed a time-consuming grinding operation.

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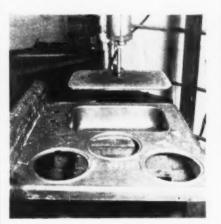
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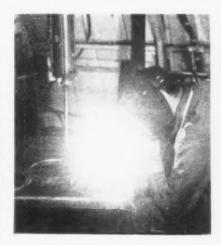
SINK, shown prior to welding, is held in position by air jack. When assembled, part forms top for combination gas range, sink and refrigerator.



SMOOTH, DENSE deposits minimize need for grinding. Entire assembly is porcelain enameled, must have smooth even surface.

Many Tried — Many electrodes were tried. Use of SteelTectic electrode, manufactured by Eutectic Welding Alloys Corp., is reported to have reduced rejects within operational limits.

The sink, in position prior to



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NO PREHEATING is needed. Production welding without removal of grease film is reported possible.

welding, is held by means of an air jack. Once the air jack is in position welding is begun.

Operation — The welding machine was set at 60 amp dc reverse polarity and a 3/32-in. electrode used. This electrode is ideal for thin gage work where high strength is needed, and the low watt input minimizes burnthrough.

Speed of application is governed by amperage used, and experienced operators can weld at high speed. No preheating is necessary and dirty or greasy metal is reported to have little or no effect upon deposit quality.

YEARS

Faster—Production rate almost doubled. Non-stop welding is possible because it is unnecessary to remove slag from previous deposits. This permits application of layer over layer without chipping.

Little grinding was necessary because of the smooth, dense deposits.

(Turn Page)



ANNOUNCING ...



OIL HARDENING TOOL STEEL

WL introduces "Whelco"—a new tool steel of M grade—a new steel of maximum toughness, hardness and strength—a steel to assure maximum results at low cost! "Whelco" offers great penetration of hardness, great toughness at high hardness, wide hardening range, fine grain structure, and desirable non-deforming characteristics. "Whelco" has good forging properties and is readily machinable in the annealed condition. All WL warehouses stock "Whelco" M tool steel in a wide variety of flats and squares. Call your nearest WL man for a trial order—the results will speak for themselves!

WL steels are metallurgically constant. This guarantees uniformity of chemistry, grain size, hard-enability—thus eliminating costly changes in heat treating specifications.

Write today for your FREE COPY of the Wheelock, Lovejoy Data Book, indicating your title and company identification. It contains complete technical information on grades, applications, physical properties, tests, heat treating, etc.

WHEELOCK, Warehouse Service

& COMPANY, INC. CAMBRIDGE • CLEVELAND CHICAGO • HILLSIDE, N. J. DETROIT • BUFFALO CINCINNATI

HYTEN SANDERSON-NEWBOULD, LTD., MONTREAL

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Set two nuts at once with the new T-J Double Clinchor! This machine is tooled to feed and set $\frac{1}{2}6$ × $\frac{1}{2}$ × $\frac{1}{2}\frac{1}{6}$ thick Fabri-Steel nuts at each operation. Both Clinchors are tripped by the same footoperated valve. Adaptable to a wide range of clinch nut setting problems.

Save labor . . . speed up production with T-J Rivitors and Clinchors adaptable to a wide range of assembly jobs today . . . in aircraft, automotive, farm machinery, stampings of all kinds!

T-J Clinchors set clinch nuts 3 to 5 times faster! Fully automatic . . . controlled by a single foot pedal. Available in Underfeed and Gravity feed models, throat depths 8'' to 36''.

T-J Rivitors automatically feed and set solid rivets . . . with high production! Electrically-powered Rivitor sets $\frac{1}{16}$ " to $\frac{1}{4}$ " diam. solid steel rivets up to $\frac{7}{8}$ " long. Air-powered Rivitor sets aluminum alloy rivets up to $\frac{1}{4}$ " diam. or steel rivets up to $\frac{1}{8}$ " diam. and up to $\frac{3}{4}$ " long. Throat

depths 8" to 36"

Write for Clinchor bulletin 847; Rivitor bulletins 646 and 847. The Tomkins-Johnson Company,

Jackson, Mich.

T-J Rivitor used for automotive clutch plate assembly. Saves time and labor doing a four-fold job—assembling, setting, inspecting and ejecting.

TOMKINS-JOHNSON

RESEARCH:

NBS electron-optical bench used as electron diffraction camera.

A versatile electron-optical bench has recently been constructed at the National Bureau of Standards for the extensive study of electron-optical elements.

Carriages for magnetic lenses, mirrors, or prisms and holders for apertures, objectives, and meshes are arranged appropriately in a vacuum chamber.

Freedom—External positioning controls are also provided, offering three degrees of freedom for each element. The bench was developed by the NBS electron physics laboratory under the direction of Dr. L. Marton.

The equipment has become an integral part of a program devoted to the investigation of extremely small electric and magnetic fields in spaces that have heretofore been inaccessible to conventional types of measurement.

Successful — Electron - optical methods have been successfully applied to the measurement of magnetic fields around magnetized recording wires, the fringe fields issuing from ferro-magnetic domains, and the space-charge distribution of a d-c cut-off magnetron.

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No

The NBS electron-optical bench can be adapted for electron-optical field mapping, as an electron microscope, electron diffraction camera, or any instrument having closely related characteristics.

For simplicity of construction and protection against X-rays, the bench is made with an all-metal cylindrical vacuum chamber.

Requirements—The bench is designed to satisfy the following requirements: (1) To accommodate three carriages for lenses with maximum diameters of 7 in. and four holders for apertures, test objects, and meshes (for use in field mapping); (2) to permit a movement of 10 in. along the axis of the bench and one-half inch radially for each component of the system without breaking the vacuum.

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CHALLENGE Precision SURFACE PLATES

LAYOUT INSPECTION

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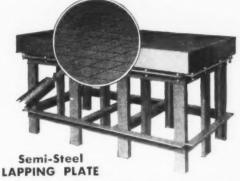
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CHECKING LAPPING

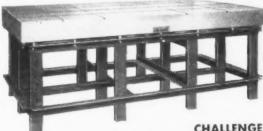
ASSEMBLY WELDING



Available either precision ground or planer finished, Challenge Layout Surface Plates offer a perfectly smooth, square surface for layout, inspection or assembly line operations. Sizes range from $12^{\prime\prime}$ x $18^{\prime\prime}$ to $54^{\prime\prime}$ x $144^{\prime\prime}$. All are built of special analysis semi-steel. The all-steel stand is arc-welded to furnish the rigidity of a one-piece unit. Special leveling screws enable the user to level the plate quickly and to lock it securely.



For Accurate Lapping of Delicate Joints. Assures perfect fit when lapping metal-to-metal joints on which no sealer is used. Ideally suited for use on parts which must be lapped perfectly to avoid oil leaks. Plates have 1/16" grooves 1/2 apart.



semi-steel WELDING TABLE

The Challenge Welding Table illustrated above provides a true, rigid surface with Tee-Slots to facilitate assembling, locating and welding. It is built of fine grain special analysis semi-steel in three standard sizes: $30 \times 60''$, $48 \times 96''$, and $54 \times 144''$; other sizes to order.

THE CHALLENGE MACHINERY COMPANY

Office, Factories and Show Room . . .

Grand Haven Michigan

TRADE-MARK @

Y DUTY-MILL TYPE ALL STEEL GONDOLAS

furnished with either 70 or 50 ton capacity trucks



for loading and unloading. Each car is reconstructed with an inside height of 2 feet 6 inches to reduce the possibility of overloading breakdowns. Whether used for railroad interchange, industrial service or mill type service, these cars will prove efficient and economical to operate.

CFC Gondola cars are reconditioned to include these special features:

- New welded steel floors up to ½" in thickness as specified by customer
- New steel sides and ends up to 3/8 in thickness as specified by customer
- New side and end top chord angles
 Double fish belly type center sills built of steel plate and angles 17" deep at body bolster to end sill and 24" deep at the center of the car. Center sills are continuous,
- Fish belly type side sills 24" deep at
- center of car

 AB, KC type or straight train line air brakes as specified.

Each car is put into first class operating condition by skilled workmen in Chicago Freight Car's own shops, Built in 1926, these gondola cars will give many years of rugged service. They are priced to give you exceptional values and are ready for prompt delivery.

GENERAL SPECIFICATIONS

Capacity, nominal	100	,000	0	lbs.
Light weight, approx	48	,000	0	lbs.
Load limit	121	,000	0	lbs.
Inside length	38	ft.	4	in.
Inside width	9	ft.	0	in.
Inside Height	2	ft.	6	in.
Length over striker	40	ft.	ó	in.
Length over striker	40	ft.	ó	in.

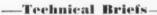
Write for specification sheet giving complete data.

CHICAGO, ILL

AUBURN, WASH.

and parts company PUEBLO, COLO.

MAIN OFFICE: 228 North LaSalle Street, Chicago 1, Illinois



LUBRICATION:

Continuous forging under high heat, pressure a problem.

A lubrication problem almost forced abandonment of a new continuous forging process at the plant of a Kentucky manufacturer, recently. The process, designed to turn out extra heavy tubing for high pressure gas and oil pipes, was saved through use of an unusual lubricant.

In the process, a hydraulically-powered ram or pusher forces lengths of heated tubing over mandrels. As they pass over the mandrels, tubes are forged with the proper curvature of bend retaining their initial diameters and wall thicknesses. Hydraulic pressure of approximately 1800 psi was required in the operation before an "Aquadag" solution was tried as a lubricant.

Costs Up—Mandrels require a special alloy and must be machined and ground to form a specified contour. Under extreme heat and pressure, the mandrels either broke or wore out quickly. They were good for the production of 6 to 30 pieces.

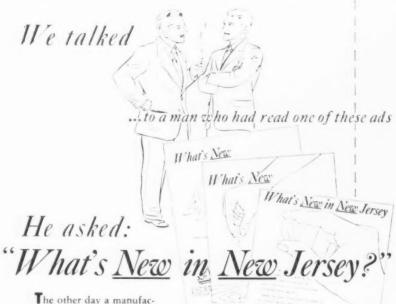
Chief problem was lubrication of the inside of the tubings so they would slide easily over the mandrels. Many types of lubricants including oils, greases and flaked graphite were tried. These burned, charred or oxidized, and formed abrasive crystals. This created greater resistance to the mandrels and scored the inside surface of the tubings.

Swab — A dilute solution of Acheson Colloids' Aquadag in water was used to swab the inside of the tubings. The water evaporated quickly and left a homogeneous film of soft colloidal graphite.

This lubricant permitted reduction of hydraulic pressure from 1800 to 400 psi. Life of mandrels was considerably extended.

Elimination of tooling repairs, less downtime, and the higher production per mandrel contributed to substantial production savings.

(Turn Page)



The other day a manufacturer from a Mid-West city stopped in our office. He said he was interested in opening a branch plant in the East, and our advertisements about New Jersey had attracted his attention.

He asked about how he could ship in materials by rail and then deliver the finished product to nearby customers by truck.

He asked about the kind of labor he could employ in New Jersey and about the size and availability of the labor force.

He asked about the distances from a New Jersey factory to the major markets of New York and Philadelphia.

And then he asked about the tax picture, questioning us about comparisons between New Jersey and other neighboring states in connection with state and local taxation.

Do you have the same kind of questions — or maybe other questions? If so, why not contact us? We will be glad to welcome you — and answer any questions you may have — just as we did for our industrial visitor from the Mid-West.

If you want to know "What's New in New Jersey," write today to Box E, Public Service Electric and Gas Co., 70 Park Place, Newark, N. J., for your copy of "An Industrialist's View of the Crossroads of the East".





PUBLIC SERVICE

Specify...The ABBOTT METHOD RIPLING MATERIALS

for SUPERIOR RESULTS . . .

LONGER OPERATING LIFE

Manufacturers of Deep Hardened and Tempered Carbon Steel Bearing Balls, Grinding and Graining Materials.

THE ABBOTT BALL COMPANY
1094 New Britain Ave., Hartford, Conn.





THE STEEL YOU BUY **DEMANDS** Complete Integration T00!

For only complete integration of every process can assure you quality-as-specified. Here is the big reason for Alan Wood Steel Company's single control of each production step-from ore mine to finished product.

Alan Wood steel making takes nothing for grantedinvolves no outside factors. We mine our own ore, test it in our own laboratories, smelt it in our own furnaces, roll it in our own rolling mills. And rigid Alan Wood quality control checks on every process-every step of the way.

Here is your warranty of quality steel as specified!

SPECIALTY PRODUCTS



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STAINLESS CLAD STEEL PERMACLAD Stainless

Clad Steel combines the surface characteristics of solid stainless with the easy forming qualities of mild carbon steel—provides corrosion resistance at lower cost.

ABRASIVE ROLLED STEEL FLOOR PLATE



A.W. ALGRIP Abrasive Rolled Steel Floor Plate is made by rolling

tough abrasive grain as an integral part of the upper portion of steel plate. Result: Positive protection against slipping, even on steep inclines.



ROLLED STEEL FLOOR PLATE A.W. SUPER-DIAMOND

Rolled Steel Floor Plate, made with an allover, engineered pattern of raised, skid-resistant diamonds, is easy to clean, easy to match, and grips without a slip.

Over 125 Years of Iron and Steel Making Experience



PRODUCTS OF ALAN WOOD STEEL COMPANY

IRON PRODUCTS

"Swede" Pig Iron Foundry, Malleable, Bessemer and Basic

STEEL PRODUCTS

Plates (Sheared) Tank, Ship, Boiler, Flange and Structural Qualities Furnished in carbon, copper, or alloy analyses A. W. Dynalloy (High Strength Plates)

HOT ROLLED SHEETS

Special qualities in carbon, copper, or alloy analyses A. W. Dynalloy (High Strength Sheets)

HOT ROLLED STRIP

Coiled and cut lengths Carbon, copper, or alloy analyses

A. W. ROLLED STEEL FLOOR **PLATES**

A. W. ALGRIP Abrasive A. W. SUPER-DIAMOND Pattern

STAINLESS CLAD STEEL

PERMACLAD Sheets and Plates Standard and special qualities available in desired finishes

A.W. CUT NAILS

Reading Brand Black, Quenched and Tempered

MINE PRODUCTS

Iron Ore Concentrates, Sintered Concentrates, Crushed Stone, Grit, Sand and Engine Sand

COKE

Foundry, Industrial and Domestic

COAL CHEMICALS

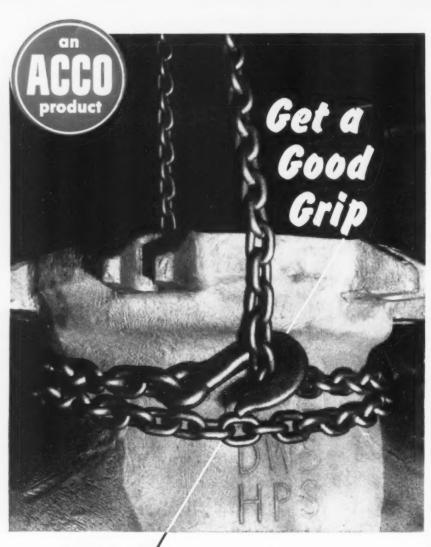
Coke Oven Gas · Crude Coal Tar Ammonium Sulphate • Industrial Benzol, Toluol, Xylol • Motor Benzol • Crude Solvent Naphtha Crude Naphthalene • Crude Tar Bases • Sodium Phenolate • Crude Light Oil Still Residue

ONE CONTROL FROM MINE TO USER

ALAN WOOD STEEL COMPANY

CONSHOHOCKEN, PA.

IVY ROCK, PA. . SWEDELAND, PA. . DOVER, N.J. . OXFORD, N.J.



WITH AN' ACCO Registered Sling Chain

• ACCO Registered Sling Chains are engineered to the job. The rings, the links, the hooks—all parts are built and tested together as a complete unit.

Look at the rugged design of the unretouched hook in the photo above. See the good grip it has on the tough yet light-in-weight, easy-to-handle Endweldur chain. Think of the lifting safety and efficiency you would get from ACCO Registered Sling Chains in your own shop.

Your American Chain distributor will give you facts and specifications on ACCO Registered Sling Chains. Call him today or write us for DH-314 ACCO Registered Sling Chain Catalog.



AMERICAN CHAIN DIVISION

York, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.



-Technical Briefs

CHROMIUM:

High purity metal is produced by reduction, electrolytic methods.

A highly refined chromium metal, malleable enough to be forged at extremely low temperatures, has been produced by metallurgists at the Albany, Oregon, station of the Bureau of Mines.

Two methods of producing highpurity chromium were tested: reduction of chromium chloride by magnesium, and hydrogen treatment of electrolytic chromium. Although the hydrogen treatment method was the most successful, neither method, the report emphasizes, produced a metal that could be bent at temperatures below 325°C without cracking.

Low Temperatures — Metal produced by refining electrolytic chromium in a hydrogen atmosphere at high temperature could be forged even at liquid air temperatures, minus 190° C, and in sheet form it could be spotwelded to chromium or iron. Further evidence of its workability was furnished by rolling, drilling, sawing, grinding, and filling it when cold.

Although chromium cannot be said to have satisfactory ductility until it can be bent at sharp angles in ordinary temperatures without cracking, the authors point out that 20 yr ago no one knew that it could be worked under any conditions at all.



So he's a tennis player—but why not a conventional congratulation.

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THE IRON AGE

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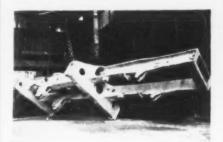
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Outsize casting replaces fabricated chassis on big shovel.

Producing a 1-piece cast steel chassis frame for the world's largest crane on rubber tires, the Lorain MC-824 Moto-Crane, has proved a tremendous undertaking.

Measuring 31 ft ½ in. long, 10 ft wide, and 3 ft 9 in. deep overall, these large unit castings are designed to replace the fabricated structure formerly used in automobile type cranes. In finished form they weigh approximately 26,260 lb.

Pit—These chassis frames are produced for the Thew Shovel Co. of Lorain, Ohio, by General Steel



LOWER MAINTENANCE is reported with this big 1-piece cast steel chassis frame. Casting is over 31 ft long, 10 ft wide.

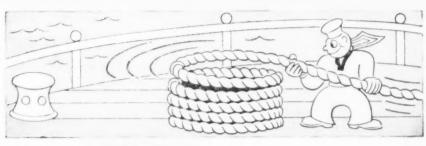
Castings Corp. in a large pit 33 ft 4 in. long, 11 ft wide and the depth varying according to the contours of the casting.

Into this pit specially shaped sand cores of various sizes are carefully placed in predescribed positions. Only open spaces, not occupied by cores, are areas later to receive the molten metal forming a one-piece casting.

Many Cores—Two hundred and two cores, whose placement requires the work of two men for five 8-hr periods are used. The pouring of 58,000 lb of metal is required to fill the mold.

Among some of the advantages of this type of chassis frame are those found in the assembly of the cranes and in lower upkeep costs in service. The chassis frame produced as a unit eliminates the handling and assembly of structural members, and simplifies assembly of the crane.





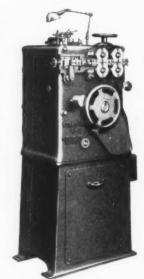
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see the man with a

Versatile Torrington Spring Coiler

In spring coiling, the words "Torrington" and "Versatile" are synonymous! When you desire springs produced to meet exacting requirements, just call the professional springmaker who has a Torrington coiler. He's the man who can fill your needs with accuracy, speed and economy. On special springs, our sales department will gladly assist you in finding a source of supply, or help your springmaker devise just the right tooling to produce it.

Torrington's 14 different Spring Coilers cover a range of wire diameters from .003" to .750"



MODEL W-11 SPRING COILER

Wire diam. range: .015" to .072". Length per spring: 0" to 42". O. D. Coil Range: 3/32" to 19/16". Produces 23 to 190 springs per minute with variable speed drive. Extra wire feed gears, torsion, other attachments available.

NOW...Spring Makers and Users can get the same answers with

The TORRINGTON SPRING TESTER

An accurate, uniform and inexpensive means of measuring spring load and deflection! For inspection or into aid in designing ar

For inspection or in-use testing . . . to aid in designing and developing springs for specific uses or as a basis for statistical quality control. Write today for illustrated bulletin on the Torrington Spring Tester!

TORRINGTON
MANUFACTURING COMPANY
TORRINGTON, CONNECTICUT

-Technical Briefs

TERNE ROOFS:

Flexible roofing material provides tight weather seal.

Wider use in plants and homes of terne metal for roofing has resulted from increased flexibility permitted by 50 ft seamless rolls and satisfactory sealing methods.

While some roofers have suggested box ternes have less "whip," others point out that "whip" is usually due to inadequate cleating.

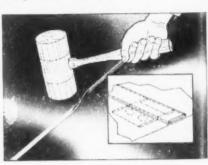
Fewer Cleats — In box terne work, roofers used at least two



FLANGES are bent upward at 90° on the long edges of the starting strip of metal in making a roofing installation.



FIRST STRIP is laid on the roof and attached by cleats hooked on the 1/2 inflange of the first strip.



SINGLE locked seam is malleted, folded side down, flat against the roof, producing a flat locked seam.

cleats on each side. With seamless roll terne comparable results can be obtained with fewer cleats if they are placed not more than 12 in.

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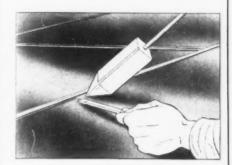
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VERTICAL flat locked seams are soldered along their free edges. Roof is corrosion resistant, leak-proof.

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apart and cleats on opposite edges of the strip are staggered.

A common belief is that flat locked seams allow for contraction and expansion where a soldered flat locked seam would break rather than give.

Terne metal expansion and contraction, however, is not a problem. A change of 100°F in temperature changes the length of a 25-ft strip of terne metal roofing by only 1/5th in., an amount easily absorbed by the elasticity of the metal itself.

Step by step instructions for application of terne metal roofing are contained in a recent issue of Follansbee Steel Corp.'s Terne Topics.

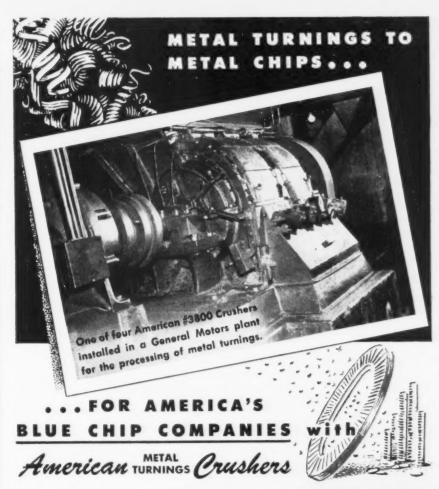
Firms Cleared for Atomic Work

Security clearances will be issued by Atomic Energy Commission to 11 companies which will participate in a program aimed at development of a nuclear reactor to produce power.

The firms, located in a number of eastern and midwestern states, will be associated with Dow Chemical Co. and Detroit Edison Co. in their joint study of the reactor problem with AEC. Each of the 11 companies will assign one or more men to work on the project on the same basis as Dow and Detroit Edison employees. A "limited number" of engineering and management executives also will be cleared to provide assistance in the work.

Other firms which can contribute to the success of the project may become associated with the program, AEC says.

(Turn Page)



WHY an AMERICAN installation makes Dollars and Sense:

These cost-conscious companies have long-since learned that American-crushed metal turnings quickly recover an initial American Crusher investment in these important ways:

\$3 to \$4 Extra Profit Per Ton: With higher scrap values for metal chips over ordinary machine shop turnings, a daily crushing capacity of only 2 tons will produce \$1200.00 per year in extra profits.

Up to 80% Less Space: Reduction to metal chips solves many expensive handling and storage problems, and allows easy briquetting.

30-50 Gallons Per Ton Cutting-Oil Recovery:

An important reclamation that adds new profits with an American Crusher installation.

> Write for Bulletin "METAL TURNINGS CRUSHERS"

PROMINENT AMERICAN CRUSHER USERS

The users of American Metal Turnings Crushers read like a 'Who's Who' of American Industry. Included are such names as:

GENERAL MOTORS . FORD TIMKEN . ALLIS-CHALMERS GENERAL ELECTRIC . BUDD WHEEL . CHRYSLER.



DIVERUL PULVERIZER COMPANY Originators and Manufacturers of 1439 MACKLIND AVE. Ring Crushers and Pulverizers

ST. LOUIS 10. MO.

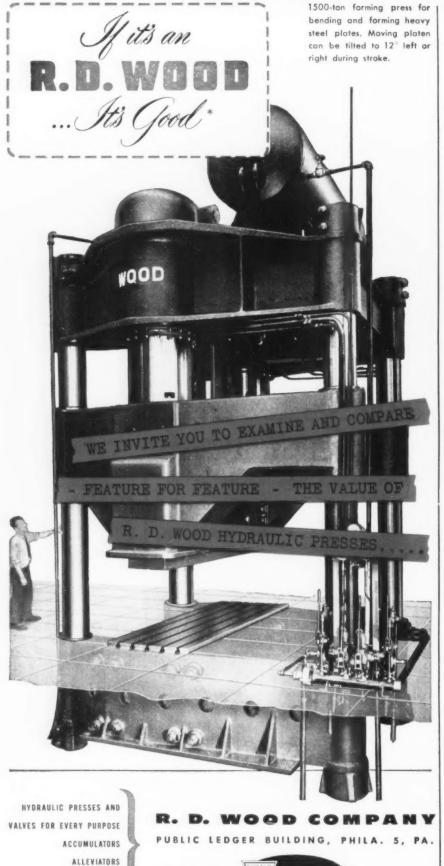
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Est. 1803

-Technical Briefs-

STANDARDS:

Requests grow for new, revised specifications, tests.

More actions than ever before on standards were submitted at the recent Fall meeting of the Administrative Committee on Standards of the ASTM. Pending publication of the 1952 book of ASTM standards and the desire to have new and revised standards included is believed to have spurred the wide interest.

All new and revised specifications will appear in the 1952 Book of ASTM Standards and some will appear prior to the publication of the big book in special compilations or separates.

Ferrous Metals—The structural steel and steel boiler plate specifications have been revised to raise the requirements for elongation in 2 in.

Clauses in the specifications covering modifications in elongation for material under 5/16 in. in thickness and over 3/4 in. in thickness have been revised.

Understandable — The rearrangement presents the modifications in a more readily understandable form. The revisions for the most part tighten the permissible modifications in elongation.

Some specifications affected by these revisions are:

Steel for Bridge and Buildings (A7)

Structural Silicon Steel (A 94) Structural Steel for Locomotives and Cars (A 113)

Structural Steel for Ships (A 131)

Low - Alloy Structural Steel (A 242)

Low and Intermediate Tensile Strength Carbon-Steel Plates of Structural Quality (A 282)

Low and Intermediate Tensile Strength Carbon-Silicon Steel Plates of Structural Quality (A 284)

Structural Nickel Steel (A 8) Boiler and Firebox Steel for Locomotives (A 30)

Openhearth Iron Plates of Flange Quality (A 129)

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STRETCH OUT YOUR STAINLESS, TOO

There are ways to stretch out your supply of stainles...

For example, you may be using a grade or finish of stainless that is in extreme demand when another similar one, not as tight, could do the job adequately.

Our metallurgical staff and stainless fabricating specialists are ready to help you look into this matter and to advise you on more readily-available types of stainless that will do a satisfactory job. Feel free to call on us for this specialized help.

CRUCIBLE

first name in special purpose steels

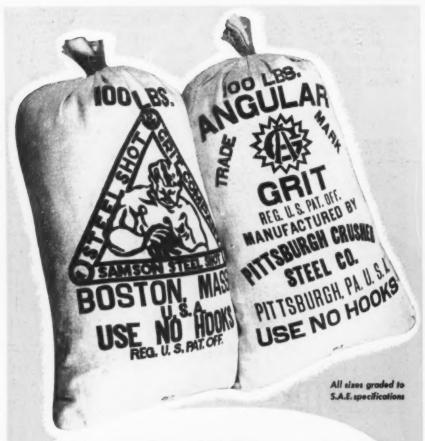
52 years of Fine steelmaking

STAINLESS STEEL

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA. REZISTAL STAINLESS . REX HIGH SPEED . TOOL . ALLOY . MACHINERY . SPECIAL PURPOSE STEELS

November 13, 1952

185



"Certified" Abrasives clean more castings per dollar!

Certified" Samson Shot and Angular Grit are made extra-tough by a special automatically controlled hardening process. They wear longer, can be used over and over again . . . actually clean more castings per dollar! Save money . . . switch to "Certified" Abrasives.

Experienced Foundrymen say:

Always specify "Certified"

ACCEPTED AND USED FOR OVER 55 YEARS



PITTSBURGH CRUSHED STEEL CO., Pittsburgh, Pa. STEEL SHOT AND GRIT CO., Boston, Mass.

-Technical Briefs

METALLIC FILLER:

Pattern shop operations simplified with synthetic metal.

Revamping and repairing of patterns in the pattern shop of Lancaster Malleable Castings Co., Lancaster, Pa., is reported to have been considerably simplified through use of a metallic filler.

The filler, a "cold-solder" has been used to give additional clear-



PATTERNS stored in convenient racks are quickly accessible for checking and repairing.



ADDITIONAL CLEARANCE is added to the core print of an aluminum match plate at the shop of Lancaster Malleable Castings Co.

ance to the core print of an aluminum match plate in order to allow clearance for setting the cope over the cores without scraping.

Dimensions — The job required 0.031 in. thickness at the parting line diminishing to 0.00 in. at the top of the core print. It was found the metallic filler was an extremely



RUSH JOBS involving changes in runners were easily made by applying a metallic filler.

tough synthetic metal and could be worked without expensive tools to create the added thickness from parting line to core print.

The job was completed in a short time and under extensive use in the foundry stood up well without chipping or peeling off the pattern.

Fillets—Another interesting application was on a small master pattern which required fillets and radii in the corners.

Cold solder, because of its easily handled plastic form was used in preference to hard-to-apply and hard-to-work hot solder. Revamping problems such as this have saved many man-hours for the firm.

Rush Job—A rush job on a pattern, involving complicated gating, required heavier runners. The repairs on this pattern were made overnight.

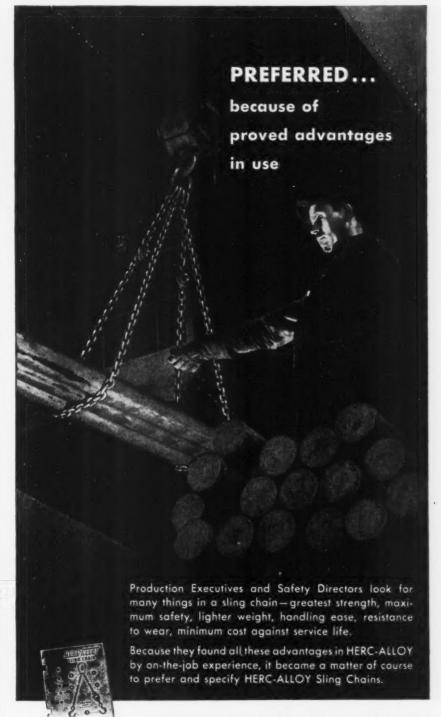
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To think how nice it seemed when the union got us shorter working hours at the plant.

MERGALLOY

SLING CHAINS



Write for illustrated Data Book No. 3 which contains helpful information on sling chain selection and use.

COLUMBUS MCKINNON CHAIN CORPORATION

(Affiliated with Chisholm-Moore Hoist Corp.)

GENERAL OFFICES AND FACTORIES: TONAWANDA, N. Y.

District Offices: New York • Chicago • Cleveland

Other Factories at Angola, N. Y., Dixon, III., St. Catharines, Ont., Can., and Johannesburg, South Africa.

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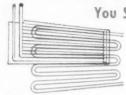
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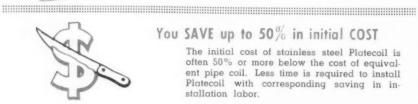
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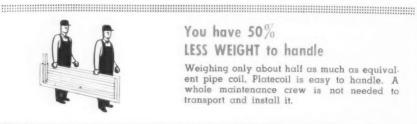
You SAVE 50% in tank SPACE

A 22" x 47" Platecoil gives the same heat transfer surface as 32 ft. of $1\frac{1}{2}$ " pipe. This pipe requires a space approximately 30" x 60". Platecoil thus saves about 50% over equivalent pipe coil in space inside your tank.



You SAVE up to 50% in initial COST

The initial cost of stainless steel Platecoil is often 50% or more below the cost of equivalent pipe coil. Less time is required to install Platecoil with corresponding saving in installation labor.



You have 50% LESS WEIGHT to handle

Weighing only about half as much as equivalent pipe coil, Platecoil is easy to handle. A whole maintenance crew is not needed to transport and install it.



You SAVE 50% in maintenance LABOR

The Platecoils can be replaced in a matter of minutes and without emptying the tank. There is no need for workmen to get inside the tank in order to make replacements.



Technical Briefs

TREADMILL:

Landing gears with less vibration can be designed.

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A 230-ton treadmill is being built by research specialists at Lockheed Aircraft Corp., Burbank, Calif. It will serve as a make-believe runway for engineers studying how to make airplane landings and takeoffs smoother.

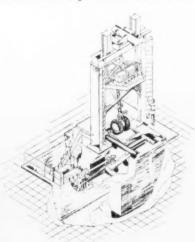
The wobble stopper will help in elimination of shimmy from aircraft landing gears. Rather than reinforce gears to withstand vibration, Lockheed designers reported they plan to do away with it entirely.

Touch and Go-Simulated takeoffs and landings of planes as large as the Super Constellation and as fast as future jet transports will be possible.

The device works like this: airplane nose landing gear units are loaded with as much as 30 tons of weight, then run on a cylindrical drum rotating at speeds simulating takeoff, landing, or taxi operations.

November-Total weight of the supporting tower, base, and rotating drum will be about 230 tons, including gear under test. First operations, scheduled for early November, will involve landing mechanisms of two experimental planes.

The periphery of the rotating drum can be provided with built-



WOBBLE STOPPER is the job of this big 230-ton tower and treadmill used for eliminating shimmy from landing gears of ex-perimental planes at Lockheed Aircraft Corp. in bumps for reproducing taxi characteristics on rough airstrips. Shimmy, being principally self-induced, may also occur on very smooth runways.

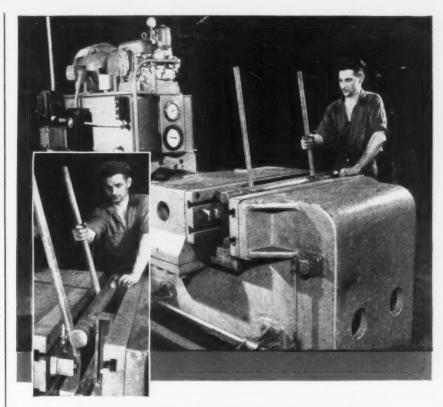
Higher Speeds—Treadmill technique will permit testing at higher speeds than possible by towing weighted landing gears across runways behind high-speed automobiles—the method used for de-

Table Tread Mill Specifications
Diam of drum
10 ft
Inertia
2000 slugs ft 2 (approx)
Surface speed
150 mph max
Stored energy
2,000,000 ft lb (approx)
Torque available
3500 ft lb (50 to 150 mph)
Power available
280 hp at 150 mph
Normal reaction force
60,000 lb max

veloping P-38 Lightning and Constellation nose gears. Designers said virtually no shimmy problem developed in either plane, but over-all results of the new device will permit faster integration of landing mechanisms into new designs.

(Turn Page)





Mercury Mfg. Co. does a better job twice as fast with a

FARQUHAR Hydraulic Press

Mercury Manufacturing Co., Chicago, Ill., producers of fork trucks, tractors and trailers, uses a 200-Ton Farquhar Horizontal Bulldozer press to make forgings and stampings and to form plates. In operation 8 hours a day, the press does most jobs twice as fast as the mechanical bulldozer used formerly, and better speed control produces better work.

In addition, many pieces of work that used to be farmed out are now done at Mercury—providing better production and quality control, and effecting additional savings of time.

In the operation shown above, high carbon brazed steel is bent quickly and accurately. In other operations, the press forms heads on bolts, legs for caster forms, and bends structural T frames.

Mercury reports very small maintenance costs, and sums up the company's satisfaction with, "It's the best!"

Farquhar Presses Cut Your Costs

Just one more example of cost-cutting Farquhar performance in heavy production! Farquhar Presses are built for the job . . . assure faster production due to rapid advance and return of the ram . . . greater accuracy because of the extra guides on moving platen . . . easy, smooth operation with finger-tip controls . . . longer life due to positive control of speed and pressure on the die . . . long, dependable service with minimum maintenance cost!

Farquhar engineers are ready to help solve whatever production problem you may have. Give them a call.

Send for Free Catalog showing Farquhar Hydraulic Presses in all sizes and capacities for all types of industry. Write to: A. B. Farquhar Co., Hydraulic Press Dept., 1503 Duke St., York, Pa.



-A. B. FARQUHAR COMPANY Division of THE OLIVER CORPORATION-



WHATEVER your custom gear requirements may be, here in our modern plant we have all conceivable facilities for providing practically every type of gear from any material in any size and in any quantity to your specifications at competitive prices.

Experienced engineers with a nation-wide reputation for ability in gear design and transmission problems are at the disposal of Perkins customers. For suggestions, ideas and cost estimates write us today.

NOTE 1: A new product is the Perkins Precision Spring Coiler. This coiler (patent applied for) turns out precision springs—any type, shape, size from wire sizes .005 to .125. Complete data and prices upon request.

2: Another new product—the **Perkins** "Bendit 15"—a patented metal forming machine which bends and shapes sheets, rods; strips tubing into innumerable complex as well as simple forms that would be difficult or even impossible to make by other means. Eliminates need for expensive tools or specialized skills. Height 47", net weight 200 lbs. Write us today for descriptive catalog, prices, etc.

PERKINS MAKES:

Helical Gears
Bevel Gears
Ratchets
Worm Gears
Spiral Gears
Spur Gears with
shaved or ground teeth
Ground Thread Worms

PERKINS MACHINE & GEAR COMPANY WEST SPRINGFIELD, MASSACHUSETTS

-Technical Briefs-

CANISTER:

Modern weapon evolved from Civil War grape shot.

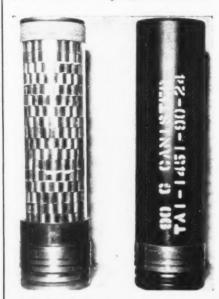
Civil War soldiers used a pile of nuts, bolts and metal scrap in front of a powder charge to stop onrushing enemy troops. They called it grape shot.

This type of ammunition, known today as canister, it still used. The canister was all but forgotten until our Army in World War II got a taste of South Pacific jungle warfare.

In Fighting — High explosive ammunition wasn't any good for close-in fighting. It's range was too long and there was generally the danger of hitting our own troops which were somewhere on the near side of the enemy.

Army Ordnance developed and rushed into production an interim design. Its effect was lethal all right. The trouble was that it quickly ruined the guns. Cans containing the shot would swell inside the gun barrel and ruin the rifling.

New Type—Now the Army has a new type of canister ammunition. One shot from a 90 mm gun throws out more than a thousand shots over a wide area. And, it has no harmful effect on the gun barrel. The Army and Marines in



ONE THOUSAND shots are thrown out of this canister type ammunition developed for 90mm gun.

Korea will soon be putting it to very effective use against the Communists.

The canister is a can-projectile containing many small shaped steel pellets which, when fired, scatter with damaging effect against massing enemy hordes at short ranges.

As the projectile leaves the gun, it breaks apart — pellets dispersing in cone-shaped fashion. The centrifugal force of the rotating projectile pushing against the air causes the pellets to disperse in this manner as the projectile breaks apart.

ENGINEERING:

Need for improved refrigeration in high speed planes noted.

A wall of intense, metal-melting heat was recently termed nature's second obstacle against supersonic flight.

The first obstacle, the supersonic barrier, has been overcome, but the wall of heat or "thermal barrier" must also be hurdled if aircraft of the future are to exceed the recently-announced record of 1300 mph, according to William Imbrie, General Electric Co. engineer.

Ram-Cooling — Present "ram-cooling" methods are incapable of preventing aircraft metals and equipment from softening at excess speeds and high altitudes, Mr. Imbrie pointed out.

Refrigeration systems prevent pilots from roasting alive, but aircraft manufacturers, faced with problems of increased drag and resultant loss of engine power, are reluctant to install additional heavy equipment needed for cooling at supersonic speeds.

Need—Either new temperatureresistant metals or more effective methods of cooling are needed, he said.

Air friction at speeds of 1300 mph at 40,000 ft produce temperature rises of more than 200°F on the plane's inner and outer surfaces, he said.

Write for New

FABRICATION

Bulletin F-3.

(Turn Page)



METAL FABRICATION

Rings

· Racks Pans

• Louvre Panels

Stampings

Cabinets



ROUND CALIFORNIA CHAIN CO .-

an important link in the nationwide Round Chain organization - is under the direction of J. D. Cavan, a Round veteran of 15 years. Like all other Round Chain Companies, Round California supplies a complete line of welded and weldless chain, slings, chain hoists, electric hoists, trolleys and winches. Sold exclusively through wholesalers and distributors.



J. D. CAVAN



Technical Briefs

PLATING:

Variables affecting electrodeposited nickel studied by NBS.

A clearer picture of the effect of plating variables on the structure and properties of electrodeposited nickel has resulted from 5-year study conducted by the National Bureau of Standards.

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The study, sponsored by the American Electroplaters' Society, included cathode current efficiencies. Internal stress of deposits was determined for a great number of bath compositions and operating conditions. Results: Chemical composition and microstructure of the deposits were investigated, and their thermal and mechanical properties were measured.

Results show hardness, tensile strength, and other properties of nickel deposits can be varied over a wide range by proper choice of plating bath.

It has been possible to explain this broad variation in properties on the basis of the physical nature of codeposited impurities present in small amounts.

Thinner Coatings-In general, the thinner coatings are used for ornamental purposes or for protection against corrosion while the heavier deposits are applied to machine parts, where resistance to wear is an important factor, and used in electroforming.

Although quite different properties are required in different applications, until now little information has been available regarding the relationship between the conditions under which the plating is done and the resulting de-

Basic Data-The NRS investigation provides a large amount of basic data which can now be utilized for the consistent production of deposits having desired properties.

While major emphasis was placed on those mechanical properties of the deposits which are of immediate value in engineering applications, data were also collected on other properties.

CATHODIC ETCHING:

Method highlights surface characteristics of metal specimens.

Studies of cathodic etching for treating metal specimens prior to photographing or microscope study has indicated its value in highlighting surface characteristics not readily detected by other etch methods. Flow lines due to cold work are given greater detail and grain boundaries are reported more precisely delineated.

Vacuum-Cathodic etching is a high vacuum process. A direct current voltage of up to 6000 v is applied at a current rating of up to 40 milliamperes to an anode inside a chamber evacuated to a pressure of from 500 microns to 5×10^{-4} mm of Hg.

The cathode then is the metallographic specimen and holder. When high voltage is applied, ionic bombardment of the metal sample results, as is evident from the bluish glow appearing inside the evacuated chamber. Molecules of material are apparently removed from the exposed metal surface. This is believed to provide the etching action.

Package-Because of the widespread interest in the method. Distillation Products Industries has developed a packaged high vacuum system for cathodic etching.

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The unit is compact with mechanical and diffusion vacuum pumps, dc high voltage supply and voltage control.



'Convinced the old suggestion box is OK,



UNITCASTINGS

.. ENGINEERED TO "TAKE IT"

Each of the above castings is the result of cooperative designs embodying the best-known foundry techniques available to assure the production of HIGH STRENGTH, MINIMUM WEIGHT, DEFECT-FREE castings. Each part is either percentage checked or 100% checked by radiographic and magnetic particle inspection.

Unitcast HAS met and WILL continue to meet the demands of industry, producing pre-determined TOP QUALITY castings, as shipped, and with personal follow-up to check machinability, fixture fit, assembly fit, etc., in YOUR PLANT.

Your successes reflect on our books. May we offer our services to challenge any knotty problem your product may present to the castings industry.



Give us a chance to offer a "cast Give us a chance to offer a "cast steel" answer for your parts problem. Our suggestions while your product is in the design stage will pay continuous dividents.

Write or call today. Unitcast Corporation, Steel Casting Division, Toledo 9, Ohio. In Canada: Canadian - Unitcast Steel, Ltd., Sherbrooke, Duebe.

UNITCASTINGS ARE FOUNDRY ENGINEERED



STYLE 1212-A PRECISION BORING MACHINE

UPPER RIGHT: Style 1212-A Precision Boring Machine equipped with hydraulically clamping fixture supported by a manually operated cross slide for indexing. Operations are precision boring and line-boring.

BELOW: All eight Ex-Cell-O Precision Boring Machines on this job (like the three shown here) have push button controls conveniently located on the left bridges. The simple fixtures are mounted on cross slides to provide indexing between various boring positions.

Typical Installation Involves Eight Ex-Cell-O Precision Boring Machines

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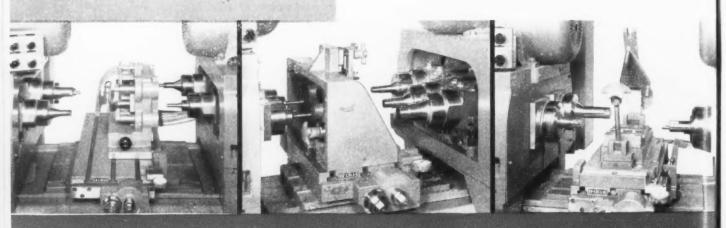
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Typical of Ex-Cell-O's contribution to the defense program is the recent installation of eight double-end Ex-Cell-O Precision Boring Machines in one plant. Used to finish magnesium and steel parts for aircraft electronic devices, they hold bore diameters to within .0005", some hole locations to within .0005", others plus or minus .0002".

While this is not a large program by Ex-Cell-O standards, it is interesting as an example of the help Ex-Cell-O machine tools and engineering are giving our patriotic defense equipment manufacturers. If you can use help of this nature contact your local Ex-Cell-O representative or write, wire or phone Ex-Cell-O in Detroit today.



EX-CELL-O CORPORATION

DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS . CUTTING TOOLS . RAILROAD PINS AND BUSHINGS DRILL JIG BUSHINGS . AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS . DAIRY EQUIPMENT



Washington Makes Plans for Early Steel Decontrol

Civilian goods to be freed first . . . Industry expects buyers' market by mid-'53 . . . Final control of military, AEC needs will be deferred . . . More emphasis on historic use.

Plans are already being made in Washington to bring about an orderly decontrol of steel as quickly as possible. The timetable is expected to shape up like this:

(1) First will come decontrol of civilian requirements. (2) Industry will return to a free market and re-establish customer relationship as it girds itself to meet a buyers' market by mid-1953. (3) Complete decontrol of military and atomic energy requirements will be deferred for some time. Even when these controls are dropped the steel industry will continue its pledge to meet all defense needs first. (4) There will be no unseemly haste in ditching controls because of the election landslide. (5) Historic use will be given more weight in placing steel orders on the books.

In addition, such decisions will be influenced strongly by an honest desire of steel industry people to operate on the basis of what's best for the country.

Production Key—Industry people now have every reason to believe that they will get less trouble, less harassment, and more real help from Washington during the next 4 years than in the recent past. Along this line fewer controls and more realistic administration of those which remain are expected.

As in the past, the steel industry's most dramatic answer to controls will continue to be record-breaking production. Steelmakers know that the quickest and best way to get rid of the frustration attending controls is to produce their way out of it. They are doing just that. They set an all-time production record in October; another is expected this month; and still another in December.

No Big Arms Cuts-No sharp cutting in actual arms or defense items is expected. Some cuts will be made but they will be aimed at eliminating waste as far as possible without impairing the defense program. Those looking for a big drop in defense business in mid-1953 may be whistling up the wrong alley. Budget reduction by elimination of waste, better organization, and better buying and scheduling is far different from meat-axe reductions regardless of defense goals. The meat-axe definitely will not be used.

There will be a real drive to rid communists from government and defense positions, big and small. The seriousness of the communist threat is one of the strongest factors keeping a full head of steam behind the defense program.

Cost Cutting—An intensified and continuing effort will be made to end the Korean war. If this is successful, price and wage controls will probably be allowed to expire on Apr. 30th. A great many key commodities and products have already been decontrolled, and there is strong sentiment among members of both parties that the \$47 million a year it costs to run Office of Price Stabilization could be saved.

There will be no labor coddling by the new Administration. It owes nothing to union leaders who tried their best to defeat it in the election. But the President-elect has made it plain he is for labor within impartial and fair balance.

Labor Harmony—Actually many people in industry believe that there is now less likelihood of bitter labor strife than in the past, although labor is not expected to drop its fight to hold its gains and its power. But the fighting will be done with the knowledge that real collective bargaining must come into its own for the first time.

The untimely death of Phil Murray, president of the CIO and the United Steel Workers of America, will not end the efforts for harmony in the steel industry. Though Mr. Murray was to have played a key role in a series of harmony conferences at grass roots level, steel leaders expect to continue the program with his successor. Keynote of this program will be solving little problems before they have time to grow into major issues.

Conversion Boom — Bolstered largely by automobile producers and their suppliers, the conversion market continues to be a strong factor in steel production. Others helping keep pressure on conversion are appliance makers, oil companies, business machine makers.

Auto makers have made conversion commitments into the second quarter. Strongest demand is for slabs for conversion into strip and sheets. Prices are high; cold-rolled sheets in Detroit are going for 11½¢ to 12¢ per lb, about double mill price. Further east the price is closer to 10¢ per lb. Conversion will continue very much in the picture through the first quarter.

The scrap iron and steel market was coasting along in many steel-making centers. Pittsburgh mills were content to balance receipts against demand. In Detroit electric furnace scrap held to its market power with tenacity. This resulted in cutting up heavy melting steel to electric furnace lengths.

Steelmaking operations this week are scheduled at 107.0 pct of rated capacity, unchanged from the last 3 weeks.



He's "squaring off" to square away your spring needs!

This workman is "squaring off" spring ends on a huge grinding machine. This is one of the many precision operations that make Barium's Cuyahoga Spring Company an outstanding quality specialist in coiled wire springs and made-to-order wire specialties, including moulding clips . . . stamped clips that need no bolts, screws or nuts.

Not only will you benefit by Cuyahoga's specialization in springs, you'll also benefit because Cuyahoga is part of

Barium Steel Corporation. For Barium is a single source for your steel needs, controlling quality from blast furnace to end product . . . a team of companies providing industry with steel in many forms. No matter which Barium company handles your order, the finest engineering research and product development is available to you from Barium's staff engineering force.

Address your steel needs to Barium Steel Corp., 25 Broad St., New York City.







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BARGES AND TUGS



Market Briefs and Bulletins

Electrical Sheets — Demand for electrical sheets is spotty, but the industry is optimistic about the market through the first quarter. Order books for transformer grade sheets are filled through the first quarter. Low and medium silicon sheets have bounced back from the slump prior to the steel strike. Premium-price producers find the market softening.

Steel Quotas Cut—First quarter 1953 export quotas for carbon steel, exclusive of tinplate, are 175,000 tons less than fourth quarter allotments. Total quota is 390,780 tons. Aluminum allotment of 4000 tons has been set, while copper wire and brass mill products were scheduled at 6078 tons.

Record Steel Output—Tennessee Coal & Iron Div. of U. S. Steel broke all previous steel production records at its Ensley and Fairfield plants in Birmingham during October. The plants produced 7727 tons more iron and 6985 tons more steel than they had ever turned out in a 1-month period.

Oven Contract—Contract for two coke oven batteries of 77 ovens each has been awarded Wilputte Coke Oven Div., Allied Chemical & Dye Corp. by U. S. Steei Co. For installation at U. S. Steel's Gary works, the ovens will be the underjet, low-differential type.

Lower Specifications—Ferro-manganese industry spokesmen are urging the government to lower specifications for standard high carbon grades of imported manganese. Low manganese content of imported ore is resulting in pricing penalties on the domestic industry. Present standard calls for 78 pct to 82 pct manganese. Industry wants this cut to 72 to 76 pct.

Production Stopped—Hearth breakout has shut down blast furnace operations at Mystic Iron Works, Everett, Mass. It is not known how long the furnace will be out of production. Preliminary report indicates the recently installed stack lining escaped serious damage. Company hopes its sizable inventory of pig iron will enable it to continue shipments without interruption.

Magnesium Plate Prices—A 20 pet cut in hot-rolled magnesium alloy plate 3/16 in, and heavier has been made by Brooks & Perkins, Inc. New base price is 50¢ per lb and is made possible by the firm's new Livonia rolling mill (THE IRON AGE, Sept. 4, p. 90).

Few Layoffs—Labor turnover statistics for September indicate one of the most favorable labor situations since World War II, reports Secretary of Labor Maurice J. Tobin. Only seven out of every 1000 factory workers were laid off, equaling the postwar low for the month reached in 1950. Employment in manufacturing plants by mid-September hit a postwar high of 16.3 million. Hiring rates were also reported at near postwar peaks for the season in the fabricated metals, electric machinery, transportation equipment and other industries.

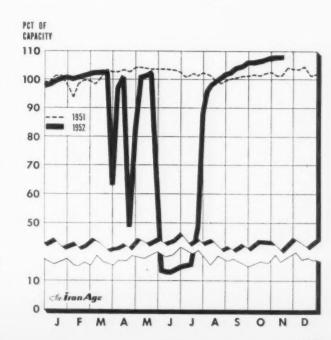
Shortage?—A critical shortage of refrigerators may develop soon unless restrictions on sheet steel supplies are relaxed, an Admiral Corp. vice-president reports. He said the company's Midwest Mfg. Corp. subsidiary at Galesburg, Ill., is currently producing refrigerators on a hand-to-mouth steel supply. Admiral ran out of refrigerators several weeks ago and entered the 1953 selling season 2 months earlier than usual with new models.

STEEL OPERATIONS



District Operating Rates

District	Week of Nov. 9	Week of Nov. 2
Pittsburgh	105.0	107.0
Chicago	111.0	111.0
Valleys	105.0	104.0
Philadelphia	0.00	0.00
West	106.0	105.0*
Buffala	106.5	106.5*
Cleveland	105.0	105.0*
Detroit	106.0	107.0*
Wheeling	101.0	0.00
Birmingham		
(South)	107.5	105.5
South Ohio River	90.0	93.0
St. Louis	98.5	101.0
East	83.0	91.0*
Aggregate	107.0	107.0
Beginning Jan. 1,	1952, open	ations are
based on annual	capacity o	f 108,587,-
670 net tons.		
* Revised		



i.

Lead, Zinc Markets Firming

Signs point to higher, not lower, prices . . . Supply position very good in zinc . . . Aluminum producers, fabricators ask delay in resumption of stockpiling—By R. L. Hatschek.

Feeling in the lead and zinc markets has shown definite signs of increasing strength. With the exception of the two recent bumps in lead prices, the markets have shown little in the way of tangible evidence. But buyers were even forming lines to purchase lead last week and total sales volume was excellent. There is a general belief that lead prices are in for some more boosting.

Zinc buying is also becoming more lively and sales on a flat price basis are increasing steadily. This, of course, is a sure indication of thinking in the market for this metal.

Production Higher — October output of slab zinc was 80,588 tons as compared to 76,019 for the preceding month. This brings the total for the first 10 months of the year to 801,504 tons. If production finishes the year at its current pace the total for 1952 will fall just short of that all-time high of 971,873 in 1943. But it's sure that this will be the second biggest year in the industry's history.

Supply position at the end of the month was very good, with unfilled orders down to 37,533 tons, the lowest point in years. Current stocks are a few thousand tons lower than at the end of the previous 3 months. But at 90,581 tons they stand far above the 33,144 tons held just prior to last summer's steel strike. Shipments totaling 84,548 tons in October top anything since April.

Ask Stockpile Loan—Representatives of the aluminum industry last week told National Production Authority they would have an order backlog of 75,000 tons by the end of the year. They said it was the biggest in history and tagged it impossible to live with. And a capacity of more than 90,000 tons a month doesn't do much good when faced by a loss of 20,000 tons a month.

This staggering loss will result from further power cuts—this time to "firm" power in both the Northwest and the Tennessee Valley—starting on Monday. Present losses are at a rate of about 17,000 tons monthly.

Proposals—Backed into a situation like this, the aluminum producers have asked that: (1) Resumption of stockpiling now set for the first quarter be again postponed, (2) consideration be given to the removal of aluminum from the national stockpile, and (3) additional metal be sought from Canada or other foreign sources.

While the diversion of 22,000 tons of Canadian aluminum to the

U. S. and postponement of repayment of the earlier loan from England will be of help, it cannot improve the situation until well into the first quarter. The industry anticipates that aluminum supplies will be ample by the beginning of the second quarter but it feels stockpiling should be held up until backlogs are trimmed to about 50,000 tons.

Get Support—Manufacturers of prime aluminum products have thrown their support behind the the aluminum producers request to hold off stockpiling temporarily. Some companies were said to have 45 days of past due orders, with small independent fabricators being affected most.

Nickel Expansion — Falconbridge Nickel Mines, Ltd., of Canada, will be allowed a credit of \$5 million by the Export-Import Bank to carry out its expansion plans. Expansion will speed up delivery to the U. S. of up to 25,000 tons of nickel and sizable quantities of cobalt and copper now covered by contracts issued by Defense Materials Procurement Agency.

Tin Firms — Last week ended with the New York open market for prompt tin 1/8¢ higher, the first change for several days. Quantity traded at the \$1.21½ price was actually small but it gives a good indication of the firm undertone in the market. The Singapore market closed at approximately \$1.16½ ex-smelter, equivalent to a New York price of about \$1.19¾ per lb.

Magnesium Exposition — The Magnesium Assn. convention opened this week with the announcement that a public exposition is to be held in Washington next spring. The first showing of its kind, its main purpose is to familiarize people with the light metal. It's a young, vigorous industry and it is aggressively after more and bigger markets.

NONFERROUS METAL PRICES

	Nov. 5	Nov. 6	Nov. 7	Nov. 8	Nov. 10	Nov. 11
Copper, electro, Conn.	24.50	24.50	24.50	24.50	24.50	24.50
Copper, Lake delivered	24.625	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York	\$1.211/B	\$1.211/8	\$1.211/4		\$1.211/4	\$1.211/4*
Zinc, East St. Louis	12.50	12.50	12.50	12.50	12.50	12.50
Lead, St. Louis	13.80	13.80	13.80	13.80	14.00	14.00
Note: Quotations are goin	g prices.					
*Tentative.						

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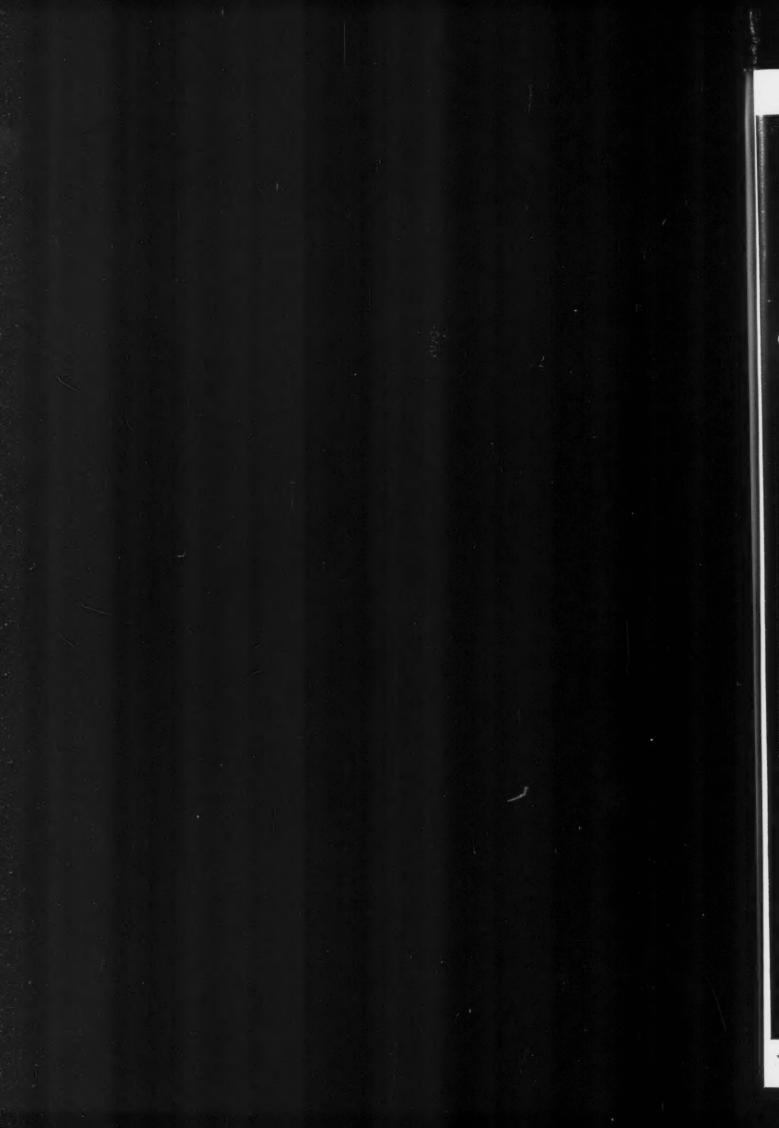
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GE





Producers of Nickel
Alloy Ingot and Shot.
Cupro Nickel Shot and
pure Copper Shot.
Special Metallurgy to
suit our customers
needs as well as
standard Master Alloys.
Highest standards of
Metallurgical Control.

Over 50 Years

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COMPANY

1701 ROCKINGHAM ROAD

DAVENPORT, IOWA

(PHONE 6-2561)

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Aluminum
(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)
Flat Sheet: 0.188 in., 2S, 3S, 31.6c; 4S, 61S-0, 33.6c; 52S, 35.8c; 24S-0, 24S-OAL, 34.5c; 75S-0, 75S-OAL, 41.9c; 0.081 in., 2S, 3S, 32.8c; 4S, 61S-0, 35.2c; 52S, 37.4c; 24S-0, 24S-OAL, 35.8c; 4S, 61S-0, 35.2c; 52S, 37.4c; 24S-0, 24S-OAL, 35.8c; 75S-0, 75S-OAL, 43.9c; 0.032 in., 2S, 3S, 34.5c; 4S, 61S-0, 39.0c; 52S, 41.8c; 24S-0, 24S-OAL, 43.8c; 75S-0, 75S-OAL, 54.8c. Plate ½ in. and Heavier: 2S-F, 3S-F, 29.7c; 4S-F, 31.7c; 53S-F, 33.4c; 61S-0, 32.3c; 24S-0, 24S-OAL, 34.0c; 75S-0, 75S-OAL, 40.7c. Extruded Solid Shapes: Shape factors 1 to 5, 35.6c to 77.2c; 12 to 14, 36.2c to 93.5c; 24 to 26, 38.7c to \$1.2c; 36 to 38, 45.9c to \$1.79. Rod, Rolled: 1.064 to 4.5 in., 2S-F, 3S-F, 39.4c to 35.2c; cold-finished, 0.375 to 3 in., 2S-F, 3S-F, 42.5c to 36.8c. Screw Machine Stock: Rounds, 11S-Ts, ½ to 11/32 in., 56.2c to 44.1c; ¾ to 1½ in., 43.6c to 41.0c; 1 9/16 to 3 in., 40.4c to 37.8c; 17S-Ts, 1.6c per lb lower. Base 5000 lb. Drawn Wire: Coiled, 0.051 to 0.374 in., 2S-F, 28.15c to 30.5c; 52S, 50.4c to 36.8c; 56S, 53.6c to 44.1c; 17S-T4, 56.7c to 39.4c; 61S-T4, 50.9c to 88.9c. Extruded Tubing: Rounds, 63S-T5, OD in in.: 1¼ to 2, 38.9c to 56.7c; 2 to 4, 35.2c to 47.8c; 4 to 6, 55.7c to 43.6c; 6 to 9, 36.2c to 45.7c, Roofing Sheet: Flat, 0.019 in. x 28 in., per sheet, 72 in., \$1.199; 96 in., \$1.59s; 120 in., \$1.997; 144 in., \$2.398. 0.24 in. x 28 in., 72 in., \$1.997; 144 in., \$2.398. 0.24 in. x 28 in., 72 in., \$1.997; 144 in., \$2.398. 0.24 in. x 28 in., 28 cp rel b. 0.024 in. x 28 in., 28.2c per lb; 0.024 in. x 28 in., 28.2c per lb.

Magnesium

(F.O.B. mill, freight allowed)

(F.O.B. mill, freight allowed)

Sheet and Plate: FS1-O, ¼ in. 63¢; 3/16 in., 65¢; ½ in., 67¢; B & S Gage 10, 68¢; 12, 72¢. Specification grade higher. Base: 30,000 lb.

Extraded Reund Red: M, diam in., ¼ to 0.311 in., 74¢; ½ to ¾ in., 57.5¢; 1¼ to 1.749 in., 58¢; 2½ to 5 in., 48.5¢. Other alloys higher. Base up to ¾ in. diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extraded Selid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated, 0.10 to 0.11 lb, 3.5 in., 62.3¢; 0.22 to 0.35 lb, 5.9 in., 58.7¢; 1.8 to 2.59 lb, 19.5 in., 55.8¢; 4 to 6 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb; ¾ to 1.80 lb, 20,000 lb; 1.80 and heavier, 30,000 lb.

Extraded Round Tubing: M, wall thickness.

30,000 lb. Extraded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057; ½ in. to \$/16, \$1.40; \$/16 to \$\frac{3}{6}, \$1.26; ½ to \$\frac{3}{6}, \$9.26; 1 to 2 in., 76¢; 0.185 to 0.219, % to \$\frac{3}{6}, \$0.26; ½ to \$\frac{3}{6}, \$0.26; ½ to \$\frac{3}{6}, \$0.26; ½ to \$\frac{3}{6}, \$0.26; 1 to 2 in., 56¢; 0.185 to 0.219, % to \$\frac{3}{6}, \$0.26; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; 3 in. and larger, 30,000.

Titanium

(100,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheets and strip, HR or CR, \$15; Plate, HR, \$12; Wire, rolled and/or drawn, \$10; Bar, HR or forged, \$6; Forgings, \$6.

Nickel and Monel

(Duse prices, 1.0.0.	
"A"]	Nickel Monel
Sheets, cold-rolled 7	
Strip, cold-rolled 8	3 63 14
Rods and bars 7	3 5834
Angles, hot-rolled 7	3 5814
Plates 7	5 5914
Seamless tubes 10	6 9314
Shot and blocks	891/

Copper, Brass, Bronze

(Freight prepaid on 200 lb)

Copper	Sheet 45.52	Rods	Extruded Shapes 45.12
Copper, h-r		41.37	- : * *
Copper, drawn.	42.34	42.62	1 4 4
Yellow brass		42.03 39.86	
Red brass		42.79	
Naval brass	44.72	38.78	40.04
Leaded brass . Com's bronze .	11 20		38.02
Mang. bronze .	44.39	44.08	43.89
	64.72	64.97	
Muntz metal Ni silver, 10 pct	42.69	38.25 54.18	39.50

PRIMARY METALS

(Cents per lb, unless otherwise noted)
Aluminum ingot, 99+%, 10,000 lb,
freight allowed 20.00
Aluminum pig 19.00
Antimony, American, Laredo, Tex., 34.50
Beryllium copper, 3.75-4.25% Be \$1.56
Beryllium aluminum 5% Be, Dollars
per lb contained Be\$69.50
Bismuth, ton lots\$2.25
Copper, Lake, delivered 24.625
Gold, U. S. Treas., dollars per oz\$35.00
Indium, 99.8%, dollars per troy oz \$2.25
Iridium, dollars per troy oz \$2.00
Lead, St. Louis 14.00
Lead, New York 14.20
Magnesium, 99.8 + %, f.o.b. Freeport,
Tex., 10,000 lb 24.50
Magnesium, sticks, 100 to 500 lb.
42.00 to 44.00
Mercury, dollars per 76-lb flask,
f.o.b. New York \$191 to \$193
f.o.b. New York \$191 to \$193 Nickel electro, f.o.b. N. Y. warehouse 59.58
Nickel oxide sinter, at Copper
Creek, Ont., contained nickel 52.75
Palladium, dollars per troy oz\$24.00
Platinum, dollars per troy oz \$90 to \$93
Silver, New York, cents per oz 83.25
Tin, New York \$1.21 1/4
Titanium, sponge \$5.00
Zinc East St. Louis 12.50
Zinc, East St. Louis
Zirconium copper, 50 pct \$6.20
Aircontain copper, so pet 40.20

REMELTED METALS

Brass Ingot

						- 3	1	-								
(Cents	per	lb,	d	lei	liı	e	re	d		a	9"	le	00	10	ls)
85-5-5-5 ing	got															
																27.25
No. 120									0				0	0	0	26.75
No. 123													0	0	0	26.25
80-10-10 in	got															
No. 305												0				33.00
No. 315												٠				30.50
88-10-2 ing	ot															
No. 210									0							41.50
No. 215																40.00
No. 245																34.50
Yellow ingo	ot															
No. 405								4								23.25
Manganese	bro	nze														
No. 421																30.50

Aluminum Ingot (Cents per lb. 100,000 lb and over)

(Cents per to, 100,000 to and o	001)
95-5 aluminum-silicon alloys	
0.30 copper, max	20.
0.60 copper, max	20.
Piston alloys (No. 122 type)	20.
No. 12 alum. (No. 2 grade)	19.
108 alloy	20.
195 alloy	20.
13 alloy (0.60 copper max.)	20.
ASX-679	20.
Steel despitation aluminum note	h h

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½% 18.80 Grade 2—92-95% 18.60 Grade 3—90-92% 18.40 Grade 4—85-90% 18.20

ELECTROPLATING SUPPLIES

Anodes (Cents per lb, freight allowed, 500 lb lots)

Copper	
	37.84
Electrodeposited	33 %
	38.34
Forged ball anodes	43
Brass. 80-20	
Cast, oval, 15 in. or longer	34%
Zinc, oval	26 1/2
Ball, anodes	25 1/2
Nickel, 99 pct plus	
	76.00
Rolled, depolarized	77.00
	\$2.15
Silver 999 fine, rolled, 100 oz lots,	
per troy oz, f.o.b. Bridgeport,	
Conn	97 1/2

Chemicals	
(Cents per lb, f.o.b. shipping poin	ita)
Copper cyanide, 100 lb drum Copper sulfate, 99.5 crystals, bbl Nickel salts, single or double, 4-100	63 12.85
lb bags, frt. allowed Nickel chloride, 375 lb drum	271/2
Silver cyanide, 100 oz lots, per oz Sodium cyanide, 96 pct domestic	67 1/4
Zinc cyanide, 100 lb drum	19.25

SCRAP METALS Brass Mill Scrap

(Cents per	pound, add		r lb for
1c for	more than	40,000	16)

	IC 1	or	77	2.0)1	.6		£.	84	1	6.7	6	40,000	10)	Cur	e- 50
Coppet													Heavy 211/2		in 20	gs
ellow													19 1/8		17	
ted b	rass		,				0	٠				0	20 1/4		19	
comm.	. bro	nze	à				0	0		0			20 1/2		19	1/4
dang.													181/4		17	%
irass	rod	enc	ls									0	18 %			

Custom Smelters' Scrap

(Cents per pound, carload to refinery)	
No. 1 copper wire	 19.25
No. 2 copper wire	 17.75
Light copper	 16.50
Refinery brass	 17.25
* Dry copper content.	 14.75

Ingot Makers' Scrap

(Cents	per pe	to r						l	01	3	9	6	le	eli	ivered
No. 1	copper	wire				0				0			0		19.25
	copper														
Light	copper		 0	0	0	٥				0		0	0		16.50
No. 1	compos	sition		0	0	٠	0		0 0	0				0.	18.50

Lathelll														
No. 1	com	pos	iti	01	1						 0 4			18.50
No. 1	com	p. 1	u	n	in	g	8				 			18.25
Rolled	bra	SS									 			15.50
Brass	pipe									*	 	2.7		16.50
Radiat	ors							0			 			14.75
				A	lu	777	\$ P	14	m					
Mixed														- 9%
Mixed	new	eli	ps							 	1	0	-	-11
Mixed	turr	ing	18,	0	ir:	y				 		9	-	- 91/4
Pots a	and 1	pan	8							 		8 1	4-	- 9

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound) Copper and Brass

No. 1 heavy copper and wire. 18%-19%	
No. 2 heavy copper and wire. 17 -174	6
Light copper 15 14-16	
New type shell cuttings 15 1/2-16	
Auto radiators (unsweated) 14	
No. 1 composition 17½—18	
No. 1 composition turnings 17 -171	6
Unlined red car boxes 1614-17	
Cocks and faucets 15 —153	2
Mixed heavy yellow brass 1112-12	
Old rolled brass 1414—15	
Brass pipe 15 ½—16	,
New soft brass clippings 16 -163	2
Brass rod ends 15 1/2 —16	,
No. 1 brass rod turnings 15 —153	3

Aluminum

Alum. pistons and struts	6 1/2 - 7
Aluminum crankcases	7 1/2
2S aluminum clippings	10 1/2
Old sheet and utensils	7 1/4
Borings and turnings	5 - 6
Misc. cast aluminum	7 1/2 - 8
Dural clips (24S)	7 1/4
Zinc	
New zinc clippings	8 - 814
Old zine	5 - 5 1/2
Zinc routings	3 1/2 - 4
Old die cast scrap	41/4- 5

Nickel and Monel

Pure nickel clippings	,		35	-36
Clean nickel turnings			35	-36
Nickel anodes			35	-36
Nickel rod ends			35	-36
New Monel clippings			28	-29
Clean Monel turnings	0		20	-21
Old sheet Monel			28	-29
Nickel silver clippings, mi	X	ed	13	-14
Nickel silver turnings, mi	*	ed	1.2	-13

Lead

Batteries,	acia	rree	0.		8. 1		0		3
		Mag	ne	25	iu	m			
Segregated								 15	-16
Castings					0			 14	-15
			11.						

Miscellaneous

Block tin	100
No. 1 pewter	70
No. 1 auto babbitt 55	-60
Mixed common babbitt 14	114 14 %
Solder joints 17	$7\frac{1}{2} - 18$
	60
Small foundry type 18	8 -1814
Monotype 13	
Lino and stereotype 13	
Electrotype 10	34-11
Hand picked type shells	8 3/4 — 9
Lino, and stereo, dross	
Electro dross	4.14
DICCHO MIUSS	7 72



Who moved Ruth?

You did, for one. And there are a hundred million others just like you.

.25 .75 .50 .50 .25 .50 .50

½ ¼

1/2

It's tough to have to move a 50-year-old town. But there's a lot of copper under Ruth, Nevada. And popular demand for copper and Brass alloys is increasing so sharply that Ruth is moving soon to the modern town of New Ruth, now abuilding.

Yes, the demand for Brass is never so urgent as it is right after a period of shortages. For then it's common knowledge, right fresh out of recent personal experience, that there are no substitutes for Brass. From plumbing fixtures to TV parts, every industry knows that there are countless applications in which there's nothing like Brass for workability, saleability

... and serviceability which makes the goldenyellow metal the lowest-cost material in the long run, on job after job.

Now if you want Brass sheet, rod and wire that's made as you want it and delivered when you need it ... then buy Bristol Brass . . . which is now rolling out of these modern mills faster than it ever did before.

The Bristol Brass Corporation, makers of Brass since 1850 in Bristol, Conn. Offices or warehouses in Boston, Chicago, Cleveland, Dayton, Detroit, Los Angeles, Milwaukce, New York, Philadelphia, Pittsburgh, Providence, Rochester.

"Bristol-Fashion" means Brass at its Best

Scrap Coasts—Respectable, Not Peppy

Pittsburgh buyers balance receipts to consumption . . . In Chicago a cautious tone shows up . . . St. Louis scrap people wait for mills to move . . . Detroit hot on electric bundles.

There were no big consumer doings in most scrap markets this week as scrap buying coasted along on the basis of being respectable but not enthusiastic.

In Pittsburgh consumers were content to receive just enough scrap to keep stockpiles from shortening. The Chicago market was reported cautious with dealer inventories losing ground. In this center blast furnace grades were being rejected if not up to snuff.

St. Louis scrap men were waiting for mills to enter the market and it was reported that mill inventories were on the decline.

Detroit still had a spirited electric furnace market. This is encouraging cutting of heavy melting steel into electric furnace lengths to take advantage of a \$6 spread. Birmingham brokers reported difficulty in moving southern scrap because of freight charges.

Pittsburgh—Scrap consumers are content to maintain a balance between receipts and consumption. Material is flowing steadily to mills but no attempt is being made to add to alreadyample inventories. Some mills continue to bear down on inspection. Most prices are at ceiling.

Chicago-Market here was again cautious with dealer inventories having a general down trend. Cast continued low item on the market. Weakness that had been reported recently in malleable continues. One brokerage firm reports holding one car for better than a month with a ceiling price asked. New accounts were difficult to find. In transit preparation had fallen better than \$2, and there is no great seeking for scrap. Into this generally slow picture came reports at press time that locomotive had gone at \$47.50 per ton. Rejections on blast furnace grades have been high. While old blast furnace orders were filled at ceiling, reports of under-ceiling sales continued.

Philadelphia—The scrap market in this district shows no significant change this week. Cast business has been slightly higher in volume but other grades are drifting along practically unchanged. Steel mills have been edging up their stockpiles during the past few weeks in preparation for winter but nobody is worried about shortages.

New York—The market here continues unchanged from last week—fairly solid but not peppy. All grades except cast are holding at ceiling prices with dealers still reporting shortages at their level. Blast furnace grades held at ceiling prices. The freight car shortage in this area was still severe, although some dealers said they needed less cars now because of shortened receipts.

St. Louis—Steel mills are expected to go into the market for their normal supply in the latter part of the week. Meanwhile they have been steadily eating into inventories, which had been heavy. Movement has been slow as truckers have not been bringing in the scrap to the yards. Railroad lists have been light but are expected to pick up sharply as they are receiving steel needed to make the necessary repairs and improvements to develop scrap. Cast iron grades continue dull.

Detroit—The continued strength of electric furnace scrap has resulted in wholesale cutting of heavy melting steel into electric furnace lengths. Obvious purpose is to pick up the approximate \$6 spread between openhearth and electric lengths. So strong is the electric furnace market that mills here are having trouble gaining on inventories for openhearths.

Cleveland — Some mills are still regulating shipments but most steel-making grades are moving freely. Movement of blast furnace scrap to Buffalo and Weirton areas is keeping those grades at ceiling but some softening is expected within the next

few weeks. Demand for electric furnace is brisk. Dealers aren't laying down any appreciable tonnages in yards as receipts remain slow.

Birmingham—Some scrap is moving north but brokers here complain they are having some difficulty in market in southern scrap due to reluctance of mills to assume freight charges. There is still a scarcity of scrap in dealers' yards, partly because dealers hesitate to pay top prices of last summer in what they consider an uncertain market and partly because farmers are just beginning to bring in scrap. The largest scrap buyer in the district is still out of the market, but the second largest is buying heavy melting steadily. The cast market is weak.

Cincinnati — Scrap men here say there has been a slight improvement in the market since election returns came in. Demand is moderate to good with cast scrap remaining one of the few speculative items. Consumers refusal to pay extreme freight rates on southern electric furnace indicates some easing of the severe shortage of that item. One mill in the area is dipping moderately into inventory reserves.

Boston—What may be a prelude to lower prices in the New England scrap market is the increasing fussiness shown by mill purchasers in the past week. They will not buy unless scrap is perfect. Meanwhile cast grades lag far behind the steel pace and stove plate is off \$1 this week to a range of \$36 to \$37 per gross ton.

Buffalo—Second largest mill consumer in this area has stretched its embargo on shipments to almost 2 months. Dealers affected are shipping through other sources to other consumers. No sign of weakness is in evidence in steelmaking grades. But mills' reserve stock are substantial. Cast grades continue easy with mill buying interest and prices unchanged.

West Coast—The cast market is being weakened by some foreign pig which is selling at \$60 or \$4 under the going price. Another softening factor is increased pig shipments by Kaiser from Fontana in an effort to build up a market for pig from its new blast furnace to be blown in early next year.

For the Purchase or Sale of Iron and Steel Scrap...

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READING, PENNA. MICHIGAN
MODENA, PENNA. PITTSBURGH, PENNA.

ERIE. PENNA.

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BOSTON, MASS. HOUSTON, TEXAS PUEBLO, COLORADO
BUFFALO, N. Y. LEBANON, PENNA. READING, PENNA.
CHICAGO, ILLINOIS LOS ANGELES, CAL. ST. LOUIS, MO.
CLEVELAND, OHIO NEW YORK, N. Y. SAN FRANCISCO, CAL.

SEATTLE, WASH.

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

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Iron and Steel SCRAP PRICES

(Maximum basing point prices, per gross ton, as set by OPS in CPR 5 and amendments.)

Switching Charge (Dollars per gross ton)		\$0.99 75 53 75 75 75	51257	76 83 26 26	134	525.52	ro.	9.0	99	20	51	.33	.57	66.52.56.65
Basing Points		Pittaburgh Johnstown Brackenridge Builer Midland Monessen Sharon	Youngstown Canton Steubenv: He Warren Weirton	Cleveland Buffalo Cincinnati N.iddletown	Chicago Claymont Coatesville Conshohocken Harrisburg Phoenixville	Sparrows Pt. Bethlehem Ashland, Ky. Kokomo, Ind. Portsmouth, O	St. Louis	Detroit	Duluth	Kansas City	Birmingham Alabama City Atlanta	Minnequa	Houston	Los Angeles Pittsburg, Cal. Portland, Ore. San Francisco
No. 1 bundles No. 1 bundles No. 1 heavy melting No. 2 heavy melting No. 2 bundles No. 2 bundles Machine shop turnings Machine shop turnings Shoveling turnings Cast iron borings No. 1 chemical borings	1 2 3 4 5 6 7 8 10 26	34.00 38.00 38.00 38.00	\$44.00 44.00 43.00 43.00 43.00 34.00 38.00 38.00 38.00 41.00	\$43.00 43.00 42.00 42.00 42.00 33.00 37.00 37.00 37.00 40.00	\$42.50 42.50 41.50 41.50 32.50 36.50 36.50 36.50 39.50	\$42.00 42.00 41.00 41.00 41.00 32.00 36.00 36.00 39.00	\$41.00 41.00 40.00 40.00 31.00 35.00 35.00 35.00 38.00	\$41.15 41.15 40.15 40.15 40.15 31.15 35.15 35.15 35.15 38.15	\$40.00 40.00 39.00 39.00 39.00 30.00 34.00 34.00 34.00 37.00	\$39.50 39.50 38.50 38.50 38.50 29.50 33.50 33.50 33.50 36.50	\$39.00 39.00 38.00 38.00 38.00 29.00 33.00 33.00 33.00 36.00	\$38.00 38.00 37.00 37.00 37.00 28.00 32.00 32.00 32.00 35.00	\$37.00 37.00 36.00 36.00 36.00 27.00 31.00 31.00 34.00	\$35.00 35.00 34.00 34.00 34.00 25.00 29.00 29.00 29.00 32.00
Forge crops Bar Crops and plate Punchings and plate Electric furnace bundles Cut struc., plate. 3 ft and less Cut struc., plate. 2 ft and less Cut. struc., 1 ft and less Foundry steel, 2 ft and less Foundry steel, 1 ft and less Heavy trimmings	11 12 14 15 16 17 18 20 21 24	49.00 46.50 46.00 47.00 49.08 50.00 44.00	51.50 49.00 46.50 46.00 47.00 49.00 50.00 44.00 46.00 43.00	50.50 48.00 45.50 45.00 46.00 48.00 49.00 43.00 45.00 42.00	50.00 47.50 45.00 44.50 45.50 47.50 48.50 42.50 44.50 41.50	49.50 47.00 44.50 44.00 45.00 47.00 48.00 42.00 44.00 41.00	48.50 46.00 43.50 43.00 44.00 46.00 47.00 41.00 43.00 40.00	48.65 46.15 43.65 44.15 44.15 46.15 47.15 41.15 43.15	47.50 45.00 42.50 42.00 43.00 45.00 46.00 40.00 42.00 39.00	47.00 44.50 42.00 41.50 42.50 44.50 45.50 39.50 41.50 38.50	48.50 44.00 41.50 41.00 42.00 44.00 45.00 39.00 41.00 38.00	45.50 43.00 40.50 40.00 41.00 43.00 44.00 38.00 40.00 37.00	44.50 42.00 39.50 39.00 40.00 42.00 43.00 37.00 39.00 36.00	42.50 40.00 37.50 37.00 38.00 40.00 41.00 35.00 37.00 34.00
No. 1 RR heavy melting Scrap rails, random lengths Scrap rails, 3 ft and less Scrap rails, 2 ft and less Scrap rails, 18 in, and less Rerolling rails Uncut tires Cut bolsters and side frames RR specialties RR 24 Solid steel axles No. 3 steel wheels Unassorted	RR 1 RR 14 RR 16 RR 17 RR 15 RR 20 RR 21 RR 23 4. 28. 29 RR 25 RR 27 RR 35	51,00 52,00 54,00 53,00 48,00 51,00 49,00 51,00 58,00 51,00	46.00 48.00 51.00 52.00 54.00 53.00 48.00 51.00 51.00 58.00 51.00	45.00 47.00 50.00 51.00 56.00 52.00 47.00 50.00 48.00 57.00 50.00 50.00	44.50 46.50 49.50 50.50 51.50 51.50 46.50 49.50 49.50 49.50 49.50 49.50	44.00 46.00 49.00 50.00 51.00 46.00 49.00 49.00 56.00 49.00 38.00	43.00 45.00 48.00 49.00 51.00 50.00 45.00 48.00 48.00 48.00 37.00	43.15 45.15 48.15 49.15 51.15 50.15 48.15 48.15 48.15 55.15 48.15	45.00 47.00 54.00 47.00	41.50 43.50 46.50 47.50 49.50 43.50 46.50 46.50 53.50 46.50 35.50	41.00 43.00 46.00 47.00 49.00 48.00 46.00 46.00 53.00 46.00	48.00 47.00 42.00 45.00 43.00 45.00 52.00 45.00	44.00 42.00 44.00 51.00 44.00	45.00 44.00 39.00 42.00 40.00 42.00 49.00 42.00

Cast Scrap Ceilings

Prices set by CPR 5, OPS

(F.o.b. all shipping points)

Grades		OPS	No.
Cupola cast		1	\$49.00
Charging box cast		2	47.00
Heavy breakable cast		-1	45.00
Cast iron brake shoes			
Stove plate		0	52.00
Unstripped motor blocks		N	
Cast iron carwheels		59	47,00
Malleable		10	55.00
Drop broken mach'y cast		11	52.00

Ceiling price of clean cast iron foundry runout or prepared cupola drops is 75 pet of corresponding grade.

Under Ceiling Scrap Prices

Pittsburgh

Machine shop turnings	 \$32,00
No. 1 machinery cast	52.00
Heavy breakable cast	 45.00
Malleable	 55.00

Chicago

Low phos. forge crops !	50.00 to	\$51.00
Cut strue., plate, 3 ft & less	44.50 t	0. 45.50
Cut struc., plate, 2 ft & less	46,50 t	47.50
Cut struc., plate, 1 ft & less	47.50 t	48.50
Machine shop turnings	30.00 t	31.50
Mixed borings, turnings.	34,00 t	0 35,50
Shoveling turnings	34.00 t	0 35,50
Cast iron borings	34.00 t	0 35.50
Cupola cast	44.00 t	9 45,00
Heavy breakable cast	41.00 t	42.00
Malleable	49,00 t	0 50,00
Stove plate	42.00 t	0 43.00
Clean auto cast	47.00 t	0 49.00
Charging box cast	42,00 t	0 43.00
Drop broken mach'y	48.00 t	0 49.00
Unstripped motor blocks.	36,00 t	0 37.00
Cast iron brake shoes	10.00 1	0 41.00

Philadelphia Area

Clean cast chem, borings.	.\$36.50	to \$37,00
Cupela cast	. 47,00	to 48.00
Unstripped motor blocks.	. 34.00	to 36.00
Charging box cast .	. 45.00	to 46,00

Cleveland

Cast iron	bor	112	×		 	\$34,00	10	\$34.50
Stove pla	to-					45,00	to	46.00
Malleable				į.		54.00	to	$a_{\sigma}, 0.0$

Youngstown

Cast Iron	borings		\$35,00	to \$35,50
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Buffalo

No. 1	machinery	east\$	49.00	to \$50.00
	enpola cast		46,00	to 47.00

Birmingham

Shoveling turnings				\$30.00	to	\$32.00
Cast iron borings .				30.00	to	32.00
No. 1 Cupola cast				46.00	to	47.00
Stove plate				41.50	to	42.50
Charging box cast				36,00	to	38,00
Heavy breakable						
Linstripped motor 1						

New York

Brokers' Bu	ying pr	ices	per	gro	188	on,	on	cars
Clean cast	chem.	bor	ings	. \$	30.0	0 to	\$3	0.50
No. 1 macl	ninery o	cast			17.0	0 to		
Mixed yar						6		3.00
Charging l						0 to		4.00
Heavy bre						0 to		5.00
Unstripped	motor	bloc	eks.		34.0	0 to	- 3	5,00

Boston

Brokers' Buying	prices	per	gross	ton.	on cars
Mixed cupola o	ust .				\$39,00
Heavy breakab	de cas	t			40.00
Stove plate					37.00
Unstripped mo	tor bl	ocks	. 30.	50 to	31.00

Detroit

Brokers' Buying prices pe	r gross	ton.	on cars
No. 1 cupola cast			\$48.00
Heavy breakable cast	. \$ 13.	110 (4)	14,00
Stove plate	. 13	00 10	44,00
Cook iven broke choos	11.14	1141 74	40.00

Cincinnati

No. 1	cupola	cast							\$49,00
Stove	plate			×					46,00
Diob	broken	cast .				\$51	,00	10	52,00

St. Louis

Charging be	ox cast		\$43,00	10 \$44.00
No. 1 cupol	a cast			43.00
Heavy brea				
t'metrinmed	manton	plene le	4	38,00

San Francisco

9	So.	•)	heavy	melt	ing					\$31.00
9	Vo.	2	bundle	5					٠	29,00
			ne sho							14,00
	Vo.	1	cupola	Cas	t			9		44.00

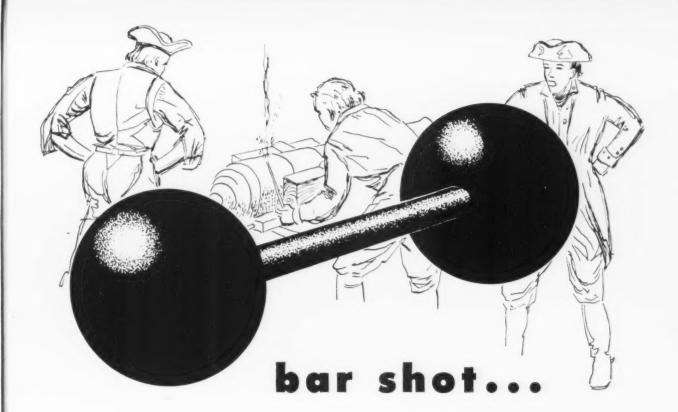
Los Angeles

No. 2 heavy melting						\$31.0
No. 2 bundles						29.0
Machine shop turn	in	H	1			14.0
Shoveling turnings			ř			20,0
No. 1 cupola cast						49.0

Seattle

Jeanic	
No. 2 bundles	\$29,00
No. 1 cupola cast	43.00
Heavy breakable	35,50
Hamilton, Ont.	
	*05 50
No. 1 hvy. melting	\$35.50
No. 1 bundles	35.50
No. 2 bundles	35.00
Mechanical bundles	33.50
Mixed steel scrap	31,50

No. 2 bundles	 35,00
Mechanical bundles	 33,50
Mixed steel scrap	 17.1 (2.11)
Mixed borings, turnings	
Rails, remelting	35,50 44,80
Rails, rerolling	30.50
Bush, new fact, prep'd	
Bush, new fact, unprep'd Short steel turnings	 22.50
Short steel turnings	50.00



... round shot, swivel shot, cannon for the Continental Army, came from Colonel George Taylor at the Durham Iron Works. On August 25, 1775, he furnished the very first shot to the State of Pennsylvania for use of the Revolutionary forces.

For today's "shot," planes, tanks, ships—and for indispensable civilian needs—millions of tons of steel are urgently required. The supply of scrap must be constantly maintained.

For the purchase or sale of iron or steel scrap . . . phone or write "Your Chicago Broker"



231 S. La Salle St., Chicago

 $Telephone\ ANdover\ 3-3900$

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in Italics.

declines appear in Italics.	week as	e printed		., .,,,
devines appear in reduce.	Nov. 11	Nov. 4	Oct. 14	Nov. 13
	1952	1952	1952	1951
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	3.775€	3.775€	3.775€	3.60€
Cold-rolled sheets	4.575	4.575	4.575	4.35
Galvanized sheets (10 ga)	5.075	5.075	5.075	4.80
Hot-rolled strip	3.725	3.725	3.725	3.50
Cold-rolled strip	5.20	5.20	5.20	4.75
Plate	3.90	3.90	3.90	3.70
Plates wrought iron	9.00	9.00	9.00	7.85
Strains C-R strip (No. 302)	36.75†	36.75†	86.75†	36.75
Tin and Terneplate: (per base bo				
Tinplate (1.50 lb.) cokes	\$8.95	\$8.95	\$8.95	\$8.70
Tinplate, electro (0.50 lb.)	7.65	7.65	7.65	7.40
Special coated mfg. ternes	7.75	7.75	7.75	7.50
Bars and shapes: (per pound)				
Merchant bars	8.95€	3.95€	3.95€	3.70€
Cold finished bars	4.925	4.925	4.925	4.55
Alloy bars	4.675	4.675	4.675	4.30
Structural shapes	3.85	3.85	8.85	3.65
Stainless bars (No. 302)	31.50†	31.50†	31.50†	31.50
Wrought iron bars	10.05	10.05	10.05	9.50
Wire: (per pound)				
Bright wire	5.225€	5.225€	5.225€	4.85€
Rails: (per 100 lb)				
Heavy rails	\$3.775	\$3.775	\$3,775	\$3.60
Light rails	4.25	4.25	4.25	4.00
Semifinished Steel: (per net ton)				
Rerolling billets	\$59.00	\$59.00	\$59.00	\$56.00
Slabs, rerolling	59.00	59.00	59.00	56.00
Forging billets		70.50	70.50	66.00
Alloy blooms, billets, slabs	76.00	76.00	76.00	70.00
Wire Rod and Skelp: (per pound	0			
Wire rods		4.325¢	4.325€	4.10€
Skelp		3.55	3.55	3.35
†Add 4.7 pct.				
Composite: (per pound)				
Finished steel base price	4.376€	4.276€	4.376€	4.131¢
, minimum need nase price	4.0106	4.0106	4.0100	4.1916

	Nov. 11 1952	Nov. 4 1952	Oct. 14 1952	Nov. 13 1951
Pig Iron: (per gross ton)				
Foundry, del'd Phila	\$60.69	\$60.69	\$60.69	\$57.97
Foundry, Valley	55.00	55.00	55.00	52.50
Foundry, Southern, Cin'ti		58.93	58.93	55.58
Foundry, Birmingham	51.38	51.38	51.38	48.88
Foundry, Chicagot	\$5.00	55.00	55.00	\$2.50
Basic del'd Philadelphia	59.77	59.77	59.77	57.09
	54.50	54.50	54.50	52.00
Basic, Valley furnace				
Malleable, Chicago	55.00	65.00	55.00	52.50
Malleable, Valley	55.00	55.00	55.00	52.50
Charcoal, Chicago		78.34	78.34	70.56
Ferromanganese	226.25	226.25	226.25	186.25
tThe switching charges for c	lelivery	to foundri	es in the	e Chicago

01

†The switching charges for delivery to foundries in the Chicago district is \$1 per ton. ‡Average of U. S. prices quoted on Ferroalloy pages.

Composite: (per gross ton) Pig iron	\$55.26	\$55.26	\$55.26	\$52.72
Scrap: (per gross ton) No. 1 steel, Pittsburgh No. 1 steel, Phila. area No. 1 steel, Chicago No. 1 bundles, Detroit Low phos., Youngstown No. 1 cast, Pittsburgh No. 1 cast, Philadelphia No. 1 cast, Chicago	41.50° 41.50° 41.15° 46.50° 49.00† 47.50	\$43.00* 41.50* 41.50* 41.15* 46.50* 49.00† 47.50 44.50	\$43.00* 41.50* 41.15* 46.50* 49.00† 47.50	\$43.00* 41.50* 41.15* 46.50* 49.00† 49.00†

* Basing pt., less broker's fee. † Shipping pt., less broker's fee

Dasing pt., less brokers ree.	Surbhing	Dect temp	DIORCI &	ca.
Composite: (per gross ton) No. 1 heavy melting scrap	\$42.00	\$42.00	\$42.00	\$42.00
Coke, Connellsville: (per net ton Furnace coke, prompt	\$14.75	\$14.75 17.75	\$14.75 17.75	\$14.75 17.75
Nonferrous Metals: (cents per po	und to la	rge buyer	8)	
Copper, electrolytic, Conn	24.50	24.50	24.50	24.50
Copper, Lake, Conn	24,625	24,625	24.625	24.625
Tin, Straits, New York	\$1.211/4+	\$1.2114	\$1.2134	\$1.03
Zinc, East St. Louis	12.50	12.50	13.50	19.50
Lead, St. Louis	14.00	13.80*	13.80	18.80
Aluminum virgin ingot	20.00	20.00	20.00	19.00
Niekel, electrolytic	59.58	59.58	59.58	59.58
Magnesium, ingot	24.50	24.50	24.50	24.50
Antimony, Laredo, Tex	34.50	34.50*	39.00	42.00

* Tentative. * Revised.

Composite Price Notes

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1949, issue.)

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Scrap Steel Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

Warehouse Price Notes

Base Quantities (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.

Exceptions: (1)500 to 1499 lb, (8)1500 to 3499 lb, (8)6000 lb or over, (4)450 to 1499 lb.

WA	RE-									Base	price, f.	o.b., dolla	ars per 1	00 lb.
HOL	JSEŞ		Sheets		Str	ip	Plates	Shapes	Ba	ra .		Alley	Bars	
Cities	City Delivery Charge	Het-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Het-Rolled	Cald-Relied		Standard	Het-Reiled	Cold- Finished	Hot-Rolled A 4615 As rolled	Hot-Rolled A 4140 Annealed	Cold-Drawn A 4615 As rolled	Cold-Drawn A 4140
Baltimore	\$.20	5.81	7.17	8.42-	6.42		6.30-	6.47	6.41	7.18-				*****
Birminghar	n .15	5.80	6.65	8.57 7.701	5.80		6.47	5.95-	6.71 5.80	7.43 8.25- 8.40				
Boston	20	6.48-	7.35- 7.52	8.59-	6.55	8,503	6.75-	6.71 6.56- 6.75	6.38-	7.63	10.78	11.15- 11.18		13.18
Buffalo	20	5.76-	6.60-	8.40-	6.16-	6.19	6.26-	5.96-	5.76-	6.00-	10.70	11.00-	12.70	12.51
Chicago	20	5.80 5.80-	6.65	8.46	6.21 5.83-		6.37 5.95-	6.08 5.95-	5.96	6.95		11.07		14.42
Cincinnati	15	6.13	6.72	8.52	5.84		6.00	6.98	6.13	6.92 7.16		11.07		13.07
Cleveland.		5.80-	6.65	8.19	6.00-		6.12-	6.28-	5.89	6.66-		10.79		12.79
Denver		5.81 7.17			6.01 7.43-	8.90	6.17	7.50-	7.61-	8.24				
Detroit		6.00-	6.81-	8.69	7.69 6.13	7.99	6.45		7.71 6.12-	6.975-	10.72	10.92	12.72	13.02
Houston		6.07	6.92 7.78-	8.68	6.61-	9.80	6.47	6.45	6.82-	7.21	11.90	11.90		13.90
Indianapol		6.79	7.79		6.75		7.07	6.79	6.98	9.62				
														12.49
Kansas Ci	ty 20	6.47	7.31	8.50- 8.72	6.51	8.07	6.62	6.62	6,50	7.57	11.15-	11.45-	13.13-	13, 43
Les Angele	es ,20	6.60	8.45-	10.55-	6.75-	9.15	6.66	6.60-	6.60-	8.36-		12.05		14.60
Memphis.	10	6.56			6.60		6.71	6.71	6,57-	7.98-				
Milwaukee	.20	5.97-	6.82	8.22	6.00-		6.12	6.12	6.00	6.83-		10.82		12.82
New Orlea	ns15	6.28	7.12		6.32		6.43	6.43	6.31	7.85				
New York	30	6.26-	7.27-		6.56	9.53	6.60	6.39-		7.53-	10.74-			
Norfolk	20	7.10	7.60	8.68	7.05 6.81		7.19	6.70 7.25	6.89	7.73 8.45	10.98	11.28	12.97	13.27
Philadelph		6.11-	7.13-		6.45			6.17-			10.57-		12.74	12.79
Pittsburgh	. 20	6.38	7.92 6.65	8.79	7.45		6.86	6.42	6.68	7.69 6.66-	10.74	11.04		13.64
	20	5.81		8.45	5.97 7.60			7.30	7.35	6.90				
		7.85	9.45		7.65		1			3.40				
Salt Lake	City20	8.30		10.904	8.45		7.85	8.00	8.40	*****		******		
San Franc	isce15	6.90	8.20	10.00-	6.90	9.25	6.75	6.50	6.70	8.40-		12.86		14 60
Seattle	,20	7.16-7.36	8.23-		7.39-		7.04		7.24-			11.70		13.70
St. Louis	20	6.10-			6.14	9.73	6.35	6.35	6.13-	6.96	10.65	10.95	12.65	12.9
St. Paul		6.30	7.31	8.71	6.50	1	6.61		6.49	7.32	1			

A

You get a far higher number of **good ones** on each run when machining





Rejects on this needle valve part

.04-

dropped 30% when the company

changed to Carpenter No. 8, Type 303.



Plant records prove it: a big majority of the troubles in machining stainless parts just aren't necessary! That's why we'd like to show you what can happen when you change from a run-of-the-mill free-machining stainless to a Carpenter Free-Machining grade. Records prove that on many jobs, rejects take a nosedive, tool life goes up, and costs down. That's because Carpenter Stainless is made in a specialty tool steel mill to highest tool steel quality standards. The same careful controls are applied to make sure every bar of Carpenter Stainless will work the same. It stands to reason that with Stainless like this you can get more good parts out of the lot. Isn't it worth a try? Just specify "Carpenter" on your next production order. The Carpenter Steel Company, 121 W. Bern St., Reading, Pa.

Export Department: The Carpenter Steel Co., Port Washington, N. Y .- "CARSTEELCO"

Carpenter

Free-Machining Stainless

takes the problems out of production

Call your nearest Carpenter Mill-Branch Warehouse, Office or Distributor

	STEEL	INC	GOTS	BILLI	ETS, BLO SLABS	DOMS,	PIPE SKELP			APES TURALS	STE		RIP		
-	PRICES	Carbon Forging Net Ton	Alloy Net Ton	Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Sheet Steel	Carbon	Hi Str. Low Alloy	Hot- rolled	Cold- rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	
7	Bethlehem, Pa.					\$76.00 B3			3.90 B3	5.80 B3					
	Buffale, N. Y.			\$59.00 B3		\$76.00 B3,		4.675 B3	3.90 B3	5 80 <i>B</i> 3	3.725 B3,	5.10 B3	5.70 B3	7.90 B3	
	Claymont, Dei.			-	R3	R3	-		-		R3				
1	Coatesville, Pa.	-	1	-											
	Conshohocken, Pa.		-	-	\$77.50 A2	\$83.90 A2					4.125 A2		5.90 .42		
	Harrisburg, Pa.			-	-										
	Hartford, Conn.														
	Johnstown, Pa.			\$59.00 B3	\$70.50 B3	\$76.00 B3			3.90 B3	5.80 B3	3.725 B3				
EASI	Newark, N. J.														
	New Haven, Conn.											5.60 Ai 5.85 DI			
	Phoenizville, Pa.	-							6.10 P2						
	Putnam, Conn.								Wile .						
	Sparrows Pt., Md.	-		-							3.725 B3	5.10 B3	5.70 B3	7.90 B3	
	Worcester, Mass.				-			-							
1	Trenton, N. J.				,							6.45 R4			
	Alton, III.										4.20 L1				
1	Ashland, Ky.										3.725 A7				
	Canton-Massillon, Ohio				\$70.50 R3	\$76.00 R3 \$78.60 T5									
	Chicago, Sterling, III.			\$59.00 U1	\$70.50 U1, R3,W8	-		4.675 UI	3.85 UI, W8	5.80 <i>U1</i>	3.725 A1,W8 4.725 N4	5.35 AI			
	Cleveland, Ohio				\$70.50 R3							5.10 A5,J3		7 45 <i>J</i> 3	
	Detroit, Mich.	\$56.00 R5	\$57.00 R5		\$73.50 R5	\$79.00 R5					4.025 G3 4.40 M2	5.30 G3 5.45 M2 5.60 D1	6.30 G3	8.15 63	
	Duluth, Minn.											6.05 D2			
WEST	Gary, Ind. Harbor, Indiana			\$59.00 U1	\$70.50 U1	\$76.00 U1,		4.675 /3	3.85 /3, U/	5.80 /3, U/ 6.30 Y/	3.725 <i>I3</i> , <i>UI</i> , <i>YI</i>	5.35 /3	5.65 /3, U/ 6.15 Y/		
MIDDLE	Granite City, III.						-	-	-						
MIE	Kekeme, Ind.								AND DESCRIPTION OF THE PARTY OF						
1	Middletown, Ohio											5.10 A7			
	Niles, Ohio										4.225 SI	5.70 T4	5.65 SI	7.30 SI	
	Sharen, Pa. Pittsburgh, Pa.	\$54.00 <i>U1</i>	\$57.00 UI	\$59.00 UI, J3	\$70.50 U1,	\$76.00 UI	3.55 U! 3.65 J3	4.675 U1	3.85 U1, J3	5.80 <i>U1,J3</i>	1.725 J3, A7 3.975 A3 4.225 S7, S9	5.80 S/ 5.10 J3, A7 5.45 A3 5.80 B4, S7			
	Portsmouth, Ohio										1.644	3.00			
						* **			4.10 W3		3.825 W3	5.10 W3	6.10 W3	7.95 W3	
	Weirton, Wheeling, Follansbee, W. Va. Youngstown, Ohio					\$76.00 Y1,	3.55 UI, R3			6.30 Y/	3.725 U1, Y1,R3	5.10 R3, Y1 5.70 C5	5.65 R3, UI	7.30 R3 7.80 Y/	
-	Fontana, Cal.	*** 20 K1	202 00 VI	270 00 VI	\$89.50 K1				4.45 K1	6.40 K1	4.975 K1	5.80 B4 6.75 K1	6.15 Y/		
	Geneva, Utah	\$81.00 \	\$83.00 K1	\$78.00 K1	\$89.50 K7	\$95.00 K1			3.85 C7	5.80 C7	4.913 K	6./3K/	9.33 8.7		
	Kansas City, Mo.				\$10.00 €7				4.45 S2	3.00 €7	4.325 S2				
-	Los Angeles,			-	\$89.50 B2	\$96.00 B2			4.45 C7,B2	6.35 B2	4.475 C7,B2	6.85 C1	6.40 B2		
WEST	Torrance, Cal.					***************************************									
	Minnequa, Colo.								4.30 C6		4.775 C6				
	San Francisco, Niles, Pittaburg, Cal.				\$89.50 B2				4.40 <i>B2</i> 4.56 <i>P9</i>	6.30 B2	4.475 <i>C7,B2</i> 4.725 <i>B2</i>		6.40 B2 6.65 B2		
-	Atlanta, Ga.				\$89.50 B2				4.50 82	6.40 B2			0.03 154		
SOUTH	Birmingham, Ala. Alabama City, Ala.			\$39.00 72	\$70.50 T2		-		3.85 T2,R3	5.80 T2	3.725 T2,R3				
20	Houston, Tegas		\$65.00 S2		450 FO F1	\$84.00 S2			4.25 S2		4.125 S2				

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STEE	BLACK PLATE	.ATE†	TINPL	WIRE				3	SHEETS				
	Hollowware Enameling 29 ga.	Electro* 0.25-lb. base box	Cokes* 1.25-lb. base box		Hot- rolled 19 ga.	Hi Str. Low Alloy Galv.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy H.R.	Long Terne 10 ga.	Enameling 12 ga.	Galvanized	Cold- rolled	Hot-rolled /8 ga. & hvyr.
Bethlehem, Pa.													
Buffalo, N. Y.							6.925 B3	5.675 B3				4.575 B3	3.775 B3
Clayment, Del.		ated mis	† Special co										
Coatesville, Pa.		95¢ from	ternes deduct			***************************************							
Conshohocken,		sking quality	price. Can-mi blackplate 55					5.925 A2					4.175 A2
Harrisburg, Pa.		from 1.25-lb	deduct \$2.20 coke base box										
Hartford, Conn.			* COKES: 1 add 25é.										
Johnstown, Pa.			ELECTRO: 25¢; 0.75-lb	4.325 B3							-		
Newark, N. J.													
New Haven, Co													
Phoenizville, Pa								Name of the second		**			
Pulnam, Conn.				-									
Sparrows Pt., N		\$7.50 B3	\$8.80 B3	4.425 B3		7.775 B3	6.925 B3	5.675 B3			5.075 B3	4.575 B3	3.775 B3
Wercester, Mas				4.625 A5									
Trenton, N. J.				4.425 R4									
Alton, III.				4.70 LI									
Ashland, Ky.										4.925 A7	5.075 A7		3.775 A7
Ohio											5.075 R3		
Chicago, Sterling, III.				4.325 A5, N4,R3				5.675 UI					3.775 W8
Cleveland, Ohio				4.325 A5			6.925 R3, J3	5.675 R3,		4.925 R3		4.575 R3, J3	3.775 R3, J3
Detroit, Mich							7.475 G3	6.225 G3				4.775 G3	3.975 G3
Duluth, Minn.													
Gary Ind. Harb	6.10 UI,	\$7.40 UI.	\$8.70 UI,	4.325 Y1			6.925 <i>13</i> ,	5.675 <i>13</i> ,	5.475 U1	4.925 UI	5.075 13, UI	4.575 13, UI, YI	3.775 /3, UI, YI
	Y/	15	13, Y1				7.425 Y/	6.175 Y/					
Granite City, III	6.30 G2	\$7.60 G2								5.625 G2	5.50 G2	5.275 GZ	4.30 G2
Kokomo, Ind. Middletown, Oh									E 475 47	4 995 47	5.475 C9	4.575 A7	
Niles, Ohie		\$7.40 R3						5.675 SI	5.475 A7	4.925 A7		4.3/3 /4/	1.175 5/
Sharon, Pa. Pittsburgh, Pa.	6.10 UI	\$7.40 UI,	\$8.70 UI,	4.325 A5		7.625 UI	6.925 UI,	5.675 UI,		4.925 U1	5.075 UI	4.575 U1,	1.775 UI.
		J3	<i>J</i> 3	4.525 P6			J3 .	J3				J3, A7	J3, A7 3.925 A3
Portamouth, Oh		***		4.525 P7					F 400 1710		F ADS 1979	4 ERE 12/2	775 W2
Weirton Wheel Follansbee, W.	6.35 W5	\$7.40 W3, W5	\$8.70 W3, W5				7.275 W3	6.025 W3	5.475 W3, W5		5.075 W3, W5	4.575 W3, W5	3.775 W3, W5
Youngstown, Ol			\$8.70 R3	4.325 Y1	5.65 E2 5.825 R/		6.925 R3 7.425 Y1	5.675 R3, U1 6.175 Y1	6.05 E2	4.925 Y/	5.775 R1	4.575 R3, Y1	R3, YI
Fontana, Cal.				5.125 <i>K1</i>			7.875 K1	6.625 K1				5.525 K1	L725 K1
Geneva, Utah													.875 C7
Kansas City, Mo													
Los Angeles, Torrance, Cal.				5.125 C7,B2	5.575 C7						5.825 C7		1.475 C7
Minnequa, Colo				4.575 C6									
San Francisco, ! Pittsburg, Cal.		\$8.15 C7	\$9.45 C7	4.975 C7							5.825 C7	5.525 C7	1.475 C7
Seattle, Wash.													****
Atlanta, Ga.													
Birmingham, Ali		\$7.50 T2	\$8.80 T2	4.325 T2.	4.925 R3			5.675 T2			5.075 T2.	4.575 T2	1.775 T2, R3
Alabama City, A				4.725 S2							R3		

Hi Str. R. Low Alloy

.90 B3

1.90 B3

45 *J*3

.30 SI

7.95 W3 7.30 R3 7.80 Y1

052

	IRON AGE		Italies identity	producers mateu	in key at case of	of table. Base p	WICES, 1,0,0.	II, in cents per .	D., unices	WIRE SOURCE.	dust sp.,	
	STEEL			BA	RS				PLA	TES		WIRE
M	PRICES	Carbon Steel	Reinforc- ing	Cold Finished	Alloy Hot- rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfgr's. Bright
1	Bathlehem Pa.				4.675 B3	6.00 B3	5.925 B3					
	Buffalo N. Y.	3.95 B3,R3	3.95 B3,R3	4.975 B5	4.675 B3, R3	6.00 B3,B5	5.925 B3	3.99 B3			5.95 B3	
1	Clayment Del.							4.35 C4		5.35 C4		
	Ceatesville Pa.							4.35 L4		5.75 <i>L4</i>		
1	Conshohocken Pa.							4.35 A2	4.95 A2		6.20 A2	
	Harrisburg Pa.							6.50 C3	6.50 C3			
	Hartford Conn.			5.475 R3		6.45 R3						
EASI	Jehnstewn Pa.	3.95 B3	3.95 B3		4.675 B3		5.925 B3	3.90 B3		5.25 B3	5.95 B3	5.225 B3
2	Newark N. J.			5.375 W10		6.35 W10						
-	New Haven Cenn.											
-	Phoenixville Pa.											
	Putnam Cenn.			5.475 W10								
1	Sparrows Pt. Md.		3.95 B3					3.90 B3		5.25 B3	5.95 B3	5.325 B3
	Worcester Mass.					6.35 A5						5.525 A5
	Trenten N. J.											
	Alten III.	4.50 L1										5.45 L1
	Ashland Ky.							3.90 A7				
1	Canton-Massillen	3.95 R3		4.925 R2,R3	4.675 R3 4.72 T5	5.99 <i>T5</i> 6.00 <i>R2,R3</i>						
	Chicage Sterling III.	3.95 U,W8, R3, 4.55 N4	3.95 R3 4.70 N4	4.925 A5,B5, W8,W10	4.675 R3 U1, W8	6.00 B5, L2, R3, W8, W10 6.05 A5		3.90 UI, W8	4.95 U1	5.25 UI	5.95 UI	5.225 A3, N4, R3 5.325 K2 5.475 W7
	Cleveland Ohio	3.95 R3	3.95 R3	4.925 A5,C13		6.00 C13 6.05 A5	5.925 R3	3.90 R3, J3	4.95]3		5.95 R3, J3	5.22\$ A5, C13,R3
	Detroit Mich.	4.10 R5 4.30 G3		5.075 <i>R5,P8</i> 5.175 <i>P3</i>	4.825 <i>R5</i> 5.025 <i>G3</i>	6.15 <i>R5</i> , <i>P8</i> 6.20 <i>P3</i>	6.675 G3	4.45 G3			6.90 G3	
15	Duluth Minn.											5.252 A5
MIDDLE WEST	Gary Ind. Harber Indiana	3.95 13, UI, YI	3.95 13, U1, Y1	4.925 L2, M5,R3	4.675 <i>13, U1,</i> <i>Y1</i>	6.90 L2,M5, R3,R5	5.925 <i>[3, U]</i> , 6.425 <i>YI</i>	3.98 <i>13, U1,</i> <i>Y1</i>	4.95 /3	5.25 UI	5.95 <i>13, U1</i> 6.45 <i>Y1</i>	5.325 M4
MID	Granite City 111.				:			4.60 G2				
	Kekeme Ind.											5.325 C9
	Middletown Ohio											
	Nilea Ohio							4.15 <i>S1</i>		5.70 SI	5.95 S1	
	Sharen Pa. Pittaburgh Pa.	3.95 U1,J3	3.95 U1,J3	4.925 A5, J3, W10, R3, C8	4.675 U1, J3	6.00 W10,C8 6.05 A5	5.925 U1, J3	3.90 U1, J3	4.95 UI, J3	5.25 U1,J3	5.95 U1,J3	5.225 A5 J3 5.475 P6
	Pertsmeuth Ohie					-						5.625 P7
	Wairton Wheeling	4.10 W3		-				3.90 WS				
	Foliansbee W. Va.	4.10 77						4.20 W3				
	Youngstewn Ohio	3.95 U1, Y1, R3	3.95 UI, YI, R3	4.925 Y1	4.675 UI,CIO, YI	6.00 C10, Y1	5.925 <i>U1</i> 6.425 <i>Y1</i>	3.90 UI, YI, R3			5.95 R3 6.45 Y/	5.225 Y/
	Fentana Cal.	4.65 K1	4.65 K1		5.725 K1		6.975 K1	4.50 K1		6.20 K1	6.55 KI	
	Geneva Utah							3.96 C7			5.95 C7	
	Kansas City Me.	4.55 S2	4.55 S2		5.275 S2							5.825 SI
WEST	Les Angeles Terrance Cal.	4.65 C7,B2	4.65 C7, B2	6.375 R3	5.725 B2		6.625 B2					6.175 C7
3	Minnequa Colo.	4.40 C6	4.75 C6					4.70 C6				5.475 C6
	San Francisco Niles Pittsburg Cal	4.65 C7,P9 4.70 B2	4.65 C7,P9 4.70 B2				6.675 B2					6.175 C6
	Seattle Wash.	4.70 B2	4.70 B2				6.675 B2	4.80 B2			6.85 B2	
	Atlanta Ga.	4.S0 A8	4.50 A8									5.475 A
SOUTH	Birmingham Ala. Alamama City Ala.	3.95 T2,R3	3.95 T2,R3				5.925 T2	3.90 T2,R3			5.95 T2	5.225 Ta
SC	Heusten Tex.	4.35 S2	4.35 S2		5.075 S2			4.30 S2				5.625 S

A1 A2 A3 A4 A5 A6 A7 A8

D1 D1 D3

EI EI

F1 F2 F3

GI GI GI

12 13 14

J1 J2 J3 J4

KI KI KI LI LI LI LI

M1 M2 M3 M4 M5

NI NI NI NI NI

F1 P2 P3 P4 P5

Тв

Key to Steel Producers

With Principal Offices

RE

83

83

45

LI

A3, R3

A5

C

5 A5. 5 P6

5 P7

5 Y/

S SI

5 C6

5 C6.C

15 48

25 TZ.

25 S2

952

5 C7,B1

- Al Acme Steel Co., Chicago
 Al Alan Wood Steel Co., Conshohocken, Pa.
- 43 Allegbeny Ludlum Steel Corp., Pittaburgh
- American Cladmetals Co., Carnegie, Pa.
- American Steel & Wire Div., Cleveland
- Angell Nail & Chaplet Co., Cleveland Armco Steel Corp., Middletown, O,
- 48 Atlantic Steel Co., Atlanta, Ga.
- 81 Babcock & Wilcox Tube Co., Beaver Falla, Pa.
- Bethlehem Pacific Coast Steel Corp., San Francisco
- R3 Bethlehem Steel Co., Bethlehem. Pa.
- Blair Strip Steel Co., New Castle, Pa.
- Bliss & Laughlin Inc., Harvey, Ill.
- Cl Calstrip Steel Corp., Los Angeles
- Carpenter Steel Co., Reading, Pa.
- Central Iron & Steel Co., Harrisburg, Pa.
- Claymont Products Dept., Claymont, Def.
- Cold Metal Products Co., Youngstown Colorado Fuel & Iron Corp., Denver
- C7
- Columbia-Geneva Steel Div. San Francisco Columbia Steel & Shafting Co., Pittsburgh
- Continental Steel Corp., Kokomo, Ind.
- C10 Copperweld Steel Co., Glassport, Pa.
- CII Crucible Steel Co. of America, New York
- C12 Cumberland Steel Co., Cumberland, Md.
- C13 Cuyahoga Steel & Wire Co., Cleveland
- DI Detroit Steel Corp., Detroit
- 02 Detroit Tube & Steel Div., Detroit
- D3 Driver Harris Co., Harrison, N. J.
- El Eastern Stainless Steel Corp., Baltimore
- 87 Empire Steel Co., Manafield, O.
- Firth Sterling Inc., McKeesport, Pa.
- F3 Fitzsimmons Steel Corp., Youngstown
 F3 Follansbee Steel Corp., Follansbee, W. Va.
- Globe Iron Co., Jackson, O.
- Granite City Steel Co., Granite City, Ill.
- G3 Great Lakes Steel Corp., Detroit
- HI Hanna Furnace Corp., Detroit
- 12 Ingersoll Steel Div., Chicago Inland Steel Co., Chicago
- 14 Interlake Iron Corp., Cleveland
- Jackson Iron & Steel Co., Jackson. O'
- 12
- Jessop Steel Corp., Washington, Pa. Jones & Laughlin Steel Corp., Pittsburgh Joslyn Mfg. & Supply Co., Chicago

- KI Kaiser Steel Corp., Fontana, Cal. KI Keystone Steel & Wire Co., Peoris
- K3 Koppers Co., Granite City, Ill.
- Laclede Steel Co., St. Louis
- 1.2 La Salle Steel Co., Chicago
- Lone Star Steel Co., Dallas
- L4 Lukens Steel Co., Coatesville, Pa.
- Mahoning Valley Steel Co., Nilea, O. McLouth Steel Corp., Detroit M3
- Mercer Tube & Mig. Co., Sharon, Pa.
- Mid-States Steel & Wire Co., Crawfordsville, Ind, Monarch Steel Co., Inc., Hammond, Ip.3
- M6 Mystic Iron Works, Everett, Mass.
- National Supply Co., Pittsburgh
- National Tube Co., Pittsburgh
- Niles Rolling Mills Co., Niles, O. N4 Northwestern Steel & Wire Co., Sterling, Ill.
- 01 Oliver Iron & Steel Co., Pittsburgh
- Page Steel & Wire Div., Monessen, Pa.
- Phoenix Iron & Steel Co., Phoenixville, Pa.
- P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
- P4 | Pittaburgh Coke & Chemical Co., Pittaburgh P5 | Pittaburgh Screw & Bolt Co., Pittaburgh

- P6 Pittsburgh Steel Co., Pittsburgh
- Portsmouth Div., Detroit Steel Corp., Detroit
- P8 Plymouth Steel Co., Detroit
- P9 Pacific States Steel Co., Niles, Cal.
- R1 Reeves Steel & Mfg. Co., Dover, O.
 R2 Reliance Div. Eaton Mfg. Co., Massillon, O.
- Republic Steel Corp., Cleveland R4
- Roebling Sons Co. (John A.), Trenton, N. J. R5 Rotary Electric Steel Co., Detroit
- Sharon Steel Corp., Sharon, Pa. Sheffield Steel Corp., Kansas City
- Shenango Furnace Co., Pittsburgh
- 54 Simonda Saw & Steel Co., Fitchburg, Mass.
- Sloss Sheffield Steel & Iron Co., Birmingham 55
- Standard Forging Corp., Chicago
- 57 Stanley Works, New Britain, Conn. Superior Drawn Steel Co., Monaca, Pa. S8
- Superior Steel Corp., Carnegie, Pa.
- S10 Sweet's Steel Co., Williamsport, Pa.
- S11 Seidelhuber Steel Rolling Mills, Seattle
- Tonawanda Iron Div., N. Tonawanda, N. Y.
 Tennessee Coal & Iron Div., Birmingham
- Tennessee Products & Chem. Corp., Nashville
- T4 Thomas Strip Div., Warren, O.
 T5 Timken Steel & Tube Div., Canton, O.
- 76 Tremont Nail Co., Wareham, Mass.
- Ul United States Steel Co., Pittsburgh U2 Universal-Cyclopa Steel Corp., Bridgeville, Pa.
- WI Wallingford Steel Co., Wallingford, Co.
- W2 Washington Steel Corp., Washington, Pa.
- W3 Weirton Steel Co., Weirton, W. Va.
- W4 Wheatland Tube Co., Wheatland, Pa
- W5 Wheeling Steel Corp., Wheeling, W. Va.
- W6 Wickwire Spencer Steel Div., Buffalo W7 Wilson Steel & Wire Co., Chicage
- W8 Wisconsin Steel Co., S. Chicago, Ill.
- W9 Woodward Iron Co., Woodward, Ala. WI Wyckoff Steel Co., Pittaburgh
- YI Youngstown Sheet & Tube Co., Youngstown

MERCHANT WIRE PRODUCTS

	Standard & Cested Nails	Weven Wire Fence 9-15/5 ga.	Fence Peats	Single Leep Bale Ties	Twisted Barbless Wire	Gal. Barbed Wire	Merch. Wire Ann'ld	Merch. Wire Gal.
Fob Mill	Cul	Cal	Cal	Col	Cal	Cel	é/lb	¢/lb;
Alabama City R3°†.	118	135		132			6.075	
Aliquipas Pa 13	127	141				148	6.075	6.525
Atlanta All	130	140		135		149	6.325	6.675
Bartonville KZ	127	139	140	132	148	148	6.075	6.58
Buffale W6							6.075	
Chicago N4°	118	137		132	146	146	6.075	6.48
Cleveland 45	1.00			ver				
Cleveland A5 Crawfrdsvl M4						555	6.075	6.225
Crawirdsvi M4	130	140		134		149	6.175	6.55
Denora Pa A5*	118	133		132		142	6.075	6.225
Duluth A5*	118	133		132		142	6.075	6,221
Fairfield Ala T2"	118	133		132		142	6.075	6, 221
Houston S2	135	147					6.475	
Johnsto Pa B3					149			4.571
Joliet III A5°	118	133		132		142	6.075	6.229
Kekeme Ind C9			142				6.175	6, 423
Las Ansalas R7							7. HZS	
Kansas City S2	139			144		160	6.675	7.123
Kansas City S2 Minnequa C6°	123	146	138	137		153	6.325	6.78
Monessen P6							****	
Meline III R3			136		:::	:::		
Pittsburg Cal C7°.	137	156		156	162	162	7.025	7.1Z3
Managan Ph	1127	1.38			147	147	6.075	6.45
Portsmouth P7 Rankin Pa A5°	132					:::	6.47	
Rankin Pa A5°	118	133	111			142	6.075	6. ZZ3
Se Unicase All'I	1110	1.33	1199	132		144	6.075	6.321
S San Fran C6				156		167	7.025	7.40
Sparrows Pt B3	129			134	151			6.675
Struthers O Y/1 Terrance Cal C7* Wercester A5*							6.075	0.473
Torrance Cal C7°	138						7.025	
Wercester A5*	124						6.375	6.525
Williamsport								
Pa S/0	1							

Cut Nails carloads base \$7.30 per 100 lb. (less 20¢ to jabbars) at Conshohocken Pa. (A2) Wheeling W. Va. (W5) \$7.80.

- * Add 45¢ per 100 lb. on Std. & Coated Nails.
- † Zinc extra if not included on Galv. Merch] Wire.
- 1 Galv. Merch. Wire based on 15¢ Zinc.

STAINLESS STEELS

Base	price,	cents	per	lb.	f.o.b.	mill.	Ads	4.7	BC
2000	bears.	Course	po.	am's	0.0	-			

Product	301	302	303	304	316	321	347	410	416	438
Ingets, rereiling	14.25	15.25	16.75	16.25	24.75	20.00	21.75	12.75	14.75	13.00
Slabs, billets, rerelling	18.50	20.00	22.00	21.00	32.25	26.25	28.50	16.50	20.00	16.75
Forg. discs, die blocks, rings	34.00	34.25	36.75	35.75	53.00	40.25	44.75	28.00	28.50	28.50
Billets, forging	26.25	26.50	28.50	27.75	41.50	31.25	35.00	21.50	22.00	22.00
Bars, wires, structurals	31.25	31.50	34.00	33.00	49.25	37.00	41.50	25.75	26.25	26.25
Plates	33.00	33.25	35,25	35,25	52.00	40.75	45.25	27.00	27.50	27.50
Sheets	41.00	41.25	43.25	43.25	57.00	49.25	53.75	36.50	37.00	39.00
Strip, het-relled	26.50	28.25	32.50	30.25	48.75	37.00	41.25	23.50	30.25	24.00
Strip, cold-rolled	34.00	36.75	40.25	38.75	59.00	48.25	52.25	30.50	37.00	31.00

STAINLESS STEEL PRODUCING POINTS—Sheets. Midland, Pa., C11 Brackenridge, Pa., A3 Butler, Pa., A7 McKeesport, Pa., U1 Washington, Pa., W2 (type 316 add 4.5¢) J3 Baltimore, E1 Middletown, O., A7 Massillon, O., R3 Gary, U1 Bridgeville, Pa., U2 New Castle, Ind., I2 Ft. Wayne, J4 Lockport, N. Y., R4.

Strip. Midland, Pa., C11 Cleveland, A3 Carnegie, Pa., S9 McKeesport, Pa., F1 Reading, Pa., C2 Washington, Pa., W2 (type 316 add 4.54); W. Leechburg, Pa., A3 Bridgeville, Pa., U2 Detroit, M2 Canton-Massillon, O., R3 Middletown, O., A7 Harrison, N. J., D3 Youngstown, C3 Lockport, N. Y., S4 Sharon, Pa., S1 (type 301 add ½4); Butler, Pa., A7 Wallingford, Conn., W1.

Bars. Baltimore, A7 Duquesne, Pa., UI Munhall, Pa., UI Reading, Pa., C2 Titusville, Pa., U2 Washington, Pa., J2 McKeesport, Pa., UI, FI Bridgeville, Pa., U2 Dunkirk, N. Y., A3 Massillon, O., R3 Chicago, UI Syracuse, N. Y., C11 Watervliet, N. Y., A3 Waukegan, A5 Lockport, N. Y., S4 Canton, O., T5 Ft. Wayne, J4

Wires. Waukegan, 45 Massillon, O., R3 McKeesport, Pa., Fl.J Ft. Wayne, J4.J Harrison, N. J., D3.J Baltimore, A7.J Dunkirk, A3 Monessen, Pl Syracuse, Cll Bridgeville, U2.

Structurels. Baltimore, A7 Massillon, O., R3 Chicago, Ill., J4 Watervliet, N. Y., A3 Syracuse, C11.

Plotes, Brackenridge Pa., A3 (type 416 add 3/4); Butler, Pa., A7 Chicago, U1 Munhall, Pa., U1 Midland, Pa. C11 New Castle, Ind., 12 Lockport, N. Y., S4 Middletown, A7 Washington, Pa., J2 Cleveland, Massillon, R3.

Forgad discs, die blocks, rings. Pittsburgh, CII Syracuse, CII Ferodale, Mich., A3 Washington, Pa., J2. ?? Forging billsts. Midland, Pa., C11 Baltimore, A7 Washington, Pa., J2 McKeesport, F1 Massillon, Canton, O., R3 Waterview, A3 Pittsburgh, Chicago, U1; Syracuse, C11.

ALLEGHENY LUDLUM-Slightly higher on Type 301; slightly lower on others in 300 series.

WASHINGTON STEEL-Slightly lower on 300 series except where noted.

PIPE AND TUBING

Base discounts f.o.b. mills. Base price about \$200 per net ton.

							BUTT	WELD									SEAM	LESS		
	1/2	In.	3/4	In.	11	in.	11/4	In.	11/2	in.	2 1	ln.	21/2-	2 In.	2 1	ln.	21/2-	3 In.	31/2-	4 In.
STANDARD T. & C.	Blk.	Gal.	Bik.	Gal.	Bik.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Bik.	Gal.	Blk.	Gal.
parrows Pt. B3 oungstown R3	30.5	8.25 10.25	33.5 35.5	12.25	35.5 38.0	15.75	36.5 38.5	16.25	37.0 39.0	17.25 19.25	37.5	17.75 19.75	38.0	18.25		******				
entana KI	21.0 32.5 31.5	+1.25 10.25 9.25	24.0 35.5 34.5	2.75 13.25 13.25	26.5 38.0 37.0	6.25 15.75 16.75	27.0 38.5 37.5	6.75 16.75 17.25	27.5 39.0 38.0	7.75 17.25 18.25	28.0 39.5 38.5	8.25 17.75 18.75	28.5 40.0 39.0	8.75 18.75 19.25	24.0	2.25	27.0	5.75	29.0	7.75
haron M3 ittsburgh N1	32.5 32.5 32.5	9.25 10.25 10.25	35.5 35.5 35.5	13.25 14.25 14.25	38.0 38.0 38.0	16.25 17.75 17.75	38.5 38.5 38.5	16.75 18.25 18.25	39.0 39.0 39.0	17.25 19.25 19.25	39.5 39.5 39.5	17.75 19.75 19.75	40.0 40.0 40.0	18.25 20.25 20.25	24.0		27.0	*******	29.0	*****
heatland W4 pungstown Y/diana Harbor Y/	32.5 32.5 31.5	10.25 10.25 9.25	35.5 35.5 34.5	13.25 14.25 13.25	38.0 38.0 37.0	15.75 17.75 16.75	38.5 38.5 37.5 38.5	16.75 18.25 17.25 18.25	39.0 39.0 38.0 39.0	17.25 19.25 18.25 19.25	39.5 39.5 38.5 39.5	17.75 19.75 18.75 19.75	40.0 40.0 39.0 40.0	18.75 20.25 19.25 20.25	24.0	3.75	27.0	6.75	29.0	8.75
TRA STRONG	32.5	15.25	35.5	14.25	38.0	17.75	38.3	10.20	39.9	13.20	33.0	19.10	40.0	20.20	24.0	3.00	21.0	0.10	23.0	
arrows Pt. B3	30.25 32.25	9.5 11.5	34.25 36.25	13.5 15.5	36.25 38.25	17.0 19.0	36.75 38.75	17.5 19.5	37.25 39.25 27.75	18.5 20.5	37.75 39.75 28.25	19.0 21.0	38.25 40.25 28.75	19.5 21.5				******	******	
sburgh J3	20.75 32.25 29.25	10.0	24.75 36.25 33.25	14.0 12.5	26.75 38.25 35.25	16.0 16.0	27.25 38.75 35.75	17.0 16.5	39.25 36.25	17.5 17.5	39.75 36.75 39.75	18.0 18.0 19.0	40.25 37.25 49.25	19.0 18.5 19.5	23.75	2.0	27.75	6.5	31.25	10.0
seling W5	32.25 32.25 32.25	10.5 11.5 11.5	36.25 36.25 36.25	14.5 15.5 15.5	38.25 38.25 38.25	17.5 19.0 19.0	38.75 38.75 38.75	18.0 19.5 19.5	39.25 39.25 39.25	18.5 20.5 20.5	39.75 39.75	21.0	40.25	21.5	23.75		27.75		31.25	
neatland W4ungstewn Y1	32.25 32.25 31.25	10.0 11.5 10.5	36.25 36.25 35.25	14.0 15.5 14.5	38.25 37.75 37.25	16.0 19.0 17.5	38.75 38.75 37.75	17.0 19.5 18.5	39.25 39.25 38.25	17.5 20.5 19.5	39.75 39.75 38.75	18.0 21.0 20.0	40.25 40.25 39.25	19.0 22.5 20.5	23.75	4.5	27.75	8.5	31.25	12.0
rain N2	32.25	11.5	36.25	15.5	38.25	19.0	38.75	19.5	39.25	20.5	39.75	21.0	40.25	21.5	23.75	4.5	27.75	8.5	31.25	12.

Galvanized discounts based on zinc, at 17¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ½ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ½ pt. 2½ in., ¾ in., ½ pt. Calculate discounts on even cents per lb of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢; Threads only buttweld and seamless, 1 pt. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 3¾ pts. higher discount. Buttweld jobbers' discount, 5 pts. St. Louis zinc price new 12.5¢.

COKE	
Furnace, beehive (f.o.b. oven)	
Connelisville, Pa\$14.5	0 to \$15.00
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa\$17.5	0 to \$18.00
Foundry, oven coke	
Buffalo, del'd	\$26.5
Chicago, f.o.b.	
Detroit, f.o.b.	
New England, del'd	24.80
Seaboard, N. J., f.o.b.	22.7
Philadelphia, f.o.b.	
Swedeland, Pa., f.o.b.	22.6
Painesville, Ohio, f.o.b.	24.0
Erie, Pa., f.o.b.	23.5
Cleveland, del'd	25.7
Cincinnati, del'd	25.0
St. Paul, f.o.b.	22.5
Ct Toule	
St. Louis	
Birmingham, del'd	21.6
Neville Island	23.0
Lone Star, Tex., f.o.b	18.5

ELECTRICAL SHEETS

22 Ga. H-R cut length F.e.b. Mill Cents Per Lb.	Armature	Elec.	Meter	Dyname	Transf. 72	Transf. 65	Transf. 58
Beech Bettem W5.		7.85	9.10	9.90	10.45	11.00	11.70
Brackenridge A3.	7.35	7.85	9.10	9.90	10.45	11.00	11.70
Granita City G2		8.55	9.80				
Ind. Harber 13	7.35	7.85	9.10				
Manafield E2	7.35	7.85	9.10	9.90			
Niles, O. N3	7.35	7.85					
Vandergrift U1	7.35	7.85	9.10	9.90	10.45	11.00	11.79
Warren, O. R3 Zanesville A7	7.35	7.85	9.10				
Zanesville A7	7.35	7.85	9.10	9.90	10.45	11.00	11.70

PIG IRON

Dollars per gress ten, f.e.b., subject to switching charges.

Basic	Foundry	Malleable	Bessemer	Lew Phes.	Bl. Furnace Silvery	Low Phos. Charcoal
56.50	57.00	57.50	58.00			
50.88	51.38					
50.88						

					66.75	
					11000	
				59.50	1,	
					1	
		00000				
		F7 40				*****
	55.00	35.09				*****
			1000	*****		68.50
	22722					
	57.50	57.50				
			5.8.5.5			
	55.00	55.00				

54.50	55.00	55.00				
56.50	57.00	57.50	58.00	62.50	*****	****
58,50	59.00	59.50	60.00			
54.50		\$5,00	55,50			
				62.50	*****	*****
			\$5.50			*****
	\$6.50 50.88 50.88 50.88 54.50 54.50 54.50 54.50 54.50 54.50 54.50 54.50 54.50 54.50 54.50 54.50 54.50 54.50	\$6.50	\$6.50	\$6.50	\$6.50	Basic Foundry Malleable Bessemer Lew Phos. Silvery

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base, (1.75 to 2.25 pct, except low phos., 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, \$2 per ton for 0.5 to 0.75 pct nickel, \$1 for each additional 0.25 pct nickel. Subtract 35¢ per ton for pheaphorus, content 0.70 pct and over. Silvery Iron: Add \$1.50 per ton met for each 0.50 pct silven over base (6.01 to 6.50 pct) up to 17 pct. \$1 per ton for 0.75 pct or more pheaphorus, manganese as above. Bessemer for outline on prices are \$1 over comparable silvery iron.

CAST IRON WATER PIPE

Per Net Ton

Cer

Bessee Chica Chevel Ensie Ensie Gary Ind. I Johns Joliet Kansa Lacka Lebar Minn Pittsb Pittsb Pittsb Pittsb Seattl Steell Strutl

Torra Youn

6 High Oil Spec Extr Reg W

aissi Miss

Nicke 10 Incom 10 Mone 10 No. 3 Pa. Alum

17. 8 7 6 4. 2 1/4

TH

Per Net Ton

6 to 24-in., del'd Chicago \$105.30 to \$108.80
6 to 24-in., del'd N.Y.. 108.50 to 109.50
6 to 24-in., Birmingham 91.50 to 96.00
6-in. and larger, f.o.b. cars, San
Francisco, Los Angeles, for all
rall shipments; rall and water
shipments less ..., \$123.00 to \$120.00
Class "A" and gas pipe, \$5 extra; 4-in.
pipe is \$5 a ton above 6-in.

BOILER TUBES

\$ per 100 ft. carload	Size		Seamless		Elec. Weld	
lots, cut 10 to 24 ft. F.o.b. Mill	OD- In.	B.W. Ga.	H.R.	C.D.	H.R.	C.D
Babcock & Wilcox	2	13			23.19	
	21/2	12			31.19	
	3	12			34.69	
	31/2	11			43.36	
	4	10	55.52	65.31	53.83	63.3
National Tube	2	13	22.81	27.94	22.23	
	21/2	12			30.51	
	31/2	12	35.87	43.93	34.98	
	31/2	11				
	4	10	54.02	66, 16		
Pittsburgh Steel	2	13		28.58		
	21/2	12	32.16	39.19		
	3	12	36.87	44.93		
	31/2	11	43.76	53.32		
	4	10		67.68		

C-R SPRING STEEL

CARBON CONTENT						
41- 60 0.61- 0.80	0.81- 1.05	1.06-				
65 8.25	10.20	12.50				
65 8.25 30 8.25	10.20	12.50				
50 8.10 65 8.25	10.20					
60 8.20						
65 8.25 95 8.55	10.20	12.50				
65 8.25	10.20	12.5				
60 8.55	10.50	12.8				
1	65 8.25	65 8.25 10.20 60 8.55 10.50				

*Sold on Pittsburgh base.

Miscellaneous Prices

RAILS, TRACK SUPPLIES

-4 In.

7.75

8.75

8.75

10.0

12.0

12.0

n., 3/4 pt. anges lé int, 5 pci

PE

Ton \$108.80 109.50 96.00

\$130.00 ; 4-in.

ec. Weld

R. C.D.

IT

1-5

12.50 12.50 12.50 12.50 12.60 12.60

1952

F.e.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts
Bessemer U1	3.775	4.25	4.925				
Chicago R3				6.65			
Cleveland R3 Ensley T2							
Ensley T2	3.775	4.25					
Fairfield T2		4.25		6.65		4.775	
Gary U1	3.775	4.25				4.775	
Ind. Harbor 13	3 775					4.775	
Johnstown B3						4.213	
Joliet UI		4 25	4 925				
Kansas City S2		1.60	4.000				
Kansas City S2 Lackawanna B3	3 775	4 25	4 925			4 775	
Lebanon B3	3. 113	4.60	4.360	6 65		4. 113	
Lebanon B3 Minnequa C6	3 775	4 75	4 925	6 65		A 775	0 9
Pittsburgh R3	0.110	4.10	4.360	0.00		4.113	3.0
Pittsburgh 01			*****				444
Pittsburgh P5	*****				****		
Pittsburgh 13				6 65	***		
Pitt'g, Cal. C7				0.03		4 025	AXE
Captilla D2				7 15		4.923	
Seattle B2 Steelten B3	9 777		4 095	7.13		4.925	
Steelten B3	3.113		4.925			4.775	
Struthers Y1							
Terrance C7						4.925	
Youngstown R3				6.65			1.5.1

TOOL STEEL

F.o.b. mill Add 4.7 pct

					Base
W	Cr	V	Mo	Co	per ll
18	4	1	-	_	\$1.505
18	4	1	-	5	\$2.13
18	4	2	-	-	\$1.65
1.5	4	1.5	8	_	81.0€
6	4	2	6	******	96.5€
High-	carbon	chromiu	m		. 63.50
Oll ha	rdened	mangan	ese		35€
Specia	l carbo	n			32.50
Extra	carbon				270
Regula	ar carbo	on			23c
Wai	rehouse	prices	on an	d east	of Mis-
		.5¢ per			
Missis	sippi, 5.	5¢ highe	er.		

CLAD STEEL

Add 4.7 pct

Stainless-carbon	Plate	Sheet
No. 304, 20 pct.		
Coatesville, Pa. L4	*29.5	
Washington, Pa. J2	*29.5	
Claymont, Del. C4	*28.00	
Conshohocken, Pa. A2		°27.50
New Castle, Ind. 12	*29.77	*26.24
Nickel-carbon		
10 pct Coatesville, Pa. L4	32.5	
Inconel-carbon		
10 pct Coatesville, Pa. L4	40.5	
Monel-carbon		
10 pct Coatesville, Pa. L4	33.5	
No. 302 Stainless-copper stainless, Carnegie,		
Pa. 44		77.00
Aluminized steel sheets, hot dip, Butler, Pa.		
A7		7.75
* Includes annealing and pickling, or a	andblast	ing.

ELECTRODES

Cents per lb, f.o.b., plant threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per Ib.
	GRAPHITE	
17, 18, 20	60, 72	17.85
8 to 16 7 6 4, 5	48, 60, 72	17.85
7	48, 60	19.57
6	48, 60	20.95
4, 5	40	21.50
3	40	22.61
2 1/4	24, 30	23.15
2	24, 30	25.36
	CARBON	
10 .	100, 110	8.45
35	65, 110	8.45
30 .	65, 84, 110	8.45
24	72 to 104	8.45
20	84, 90	8.45
17	60, 72	8.45
1.4	60, 72	9.02
10, 12	60	9.30
8	60	9.58

FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill. Price, net ton; Effective CaF; content: 70% or more \$43.00 60% or less 40.00

NO. OO HAMILTON PRECISION SMALL GEAR HOBBER

.0001" COMPOSITE

error

Spur gear: brass: 48 diametral pitch: 50 teeth: 20° pressure angle: less than .0001" composite error: generated on Hamilton No. 00 Precision Gear Hobber.

DEMANDS for mechanical accuracy become more and more insistent as new and improved designs reach production. And machine tools, purchased without consideration for future accuracy requirements, become obsolete before they are depreciated.

Protect your investment in gear generating equipment. Buy the one small gear hobber

which is precise enough to meet future requirements, and rigid enough to hold its precision. Buy Hamilton!



tion at left) made before secondary operation. Heavy lines equal .001"—light lines equal .0002". Gear made .004" undersize to allow for secondary operation.

ACTUAL TEST (see illustra-

Get the full story! Write for free Bulletin No. 5234 today.

Hamilton TOOL COMPANY

No Need For Expensive Patterns



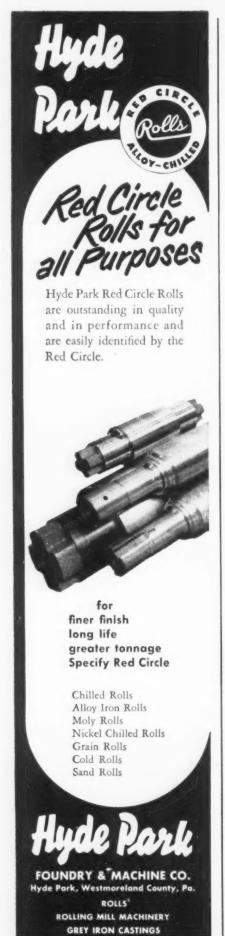
HOBBER

Whether your production items number 1 or 100, it doesn't pay to use castings. A Continental precision weldment can solve your problem. It will also pay you to call on Continental for redesigning your product for strengthweight-size factors. Shown here are two examples of Continental's versatility in the fabrication of parts and assemblies to fit your particular needs. For full information, write for our folder.

CONTINENTAL Boiler & Sheet Iron Works

5600 West Park Avenue St. Louis 10, Mo.





Miscellaneous Prices-**BOLTS, NUTS, RIVETS, SCREWS**

Consumer Prices

(Base, discount, f.o.b. mill, Pittaburgh, Cleveland, Birmingham or Chicago)

Nuts, Hot Pressed, Cold Punched-Sq.

PC	Less	List	Less	
	Keg.	K.	Keg.	K.
	R	esc.	H	y.
in. & smaller.	15	28 14	15	2814
716 in. & % in. in. to 1½ in.		25	6 1/2	21
inclusive	9	23	1	1634
1% in. & larger.	7 3/9	22	1	16 1/2

Nuts, Hot Pressed—Hexagon

1/2 in. & smaller.		37	22	34
9/16 in. & % in. % in. % in.	161/2	29 1/2	6 1/8	21
inclusive	12	25	2	1734
1% in. & larger.	81/8	23	2	1736

Nuts, Cold Punched—Hexagon

1/4 in. & smaller.		37	22	34
9/16 in. & % in. % in.	23	35	171/4	30 1/4
inclusive	1914	31 1/2	12	25

Nuts, Semi-Finished—Hexagon

	R	eg.	Hvy.	
1/2 in. & smaller.	35	45	28 14	29 14
9/16 in. & % in. % in. % in.	23	35	17 1/4	29 1/4 30 1/4
inclusive	24	36	15	28 1/2
1% in. & larger.	13	26 Light	8 1/8	23
7/16 in. & small-				
er	35	45		
½ in. thru ½ in. ¾ in. 1½ in.	28 1/4	39 1/2		
inclusive	26	27		

Stove Bolts Pet Off List

Packaged, steel, plain finished 48—10
Packaged, plain finish 31—10
Bulk, plain finish 62°
*Discounts apply to bulk shipments in
not less than 15,000 pieces of a size and
kind where length is 3-in. and shorter;
5000 pieces for lengths longer than 3-in.
For lesser quantities, packaged price appiles.

piles.

**Zinc, Parkerized, cadmium or nickel
plated finishes add 6¢ per lb net. For
black oil finish, add 2¢ per lb net.

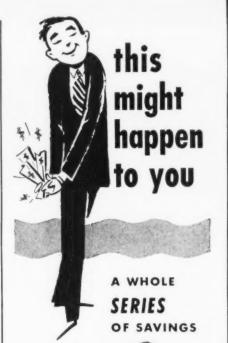
Riv	rets										E	36	34	86	,	P	6	r	100	1	10
3/6	in.	&	larger	0	0		0	0	6	0	0								\$7	3.	16

Cap and Set Screws

(In bulk) Pet Off	List
Hexagon head cap screws, coarse or	
fine thread, ¼ in. thru % in. x 6	
in., SAE 1020, bright	54
% in. thru 1 in. up to & including 6 in.	
1/4 in. thru 1/4 in. x 6 in. & shorter	
high C double heat treat	46
% in. thru 1 in. up to & including 6 in.	41
Milled studs	35
Flat head cap screws, listed sizes	16
Fillister head cap, listed sizes	34
Set screws, sq head, cup point, 1 in.	
diam. and smaller x 6 in. & shorter	53

Machine and Carriage Bolts

	Pet Of	g List
	Case	C.
14 in. & smaller x 6 in. & shorter	15	28 1/2
shorter	181/2	80 1/2
shorter	1736	29 1/2
All diam. longer than 6 in Lag, all diam. x 6 in. &	14	271/2
shorter	23	35
6 in	31	33
Plow bolts	34	



Fire No.

Sille

Mt.

Hay Chi We Sup T

Sili Sili A Sili

Sili

Chi

Ma

Gre

Doi in in in

Dec

51.l

Old Me: Me: Hig

wil

ma Dec Lal

Flootses Swa No Can Doll Fele The Can Man Moo Nico Nico Sili Sta Tinn Tun Zin Zin Zin

TH



Requirements were strict—the parts had to be small, light—had to stand up under hard servicetolerances were close Yet with Illinois help they were designed for our fast, economical, automatic production. Thus we helped "Osterette" quality Mixer get on the market —at the right time and priced for volume sales. Call us in early enough—we may help your design, do spring experimental work, produce in any volume. If specifications are already established, we will manufacture economically, dependably to exact requirements. Your inquiries invited.

SPRINGS STAMPINGS WIRE FORMS BY

00



2100 N. MAJOR AVE., CHICAGO 39, ILL. Phone NAtional 2-8100

Miscellaneous Prices

REFRACTORIES

REPRACIORIES	
Fire Clay Brick Carloads, per 1000	
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5)\$94.60 No. 1 Ohio	
Silica Brick	
Mt. Union, Pa., Ensley, Ala	
Chrome Brick Per Net Ton	
Standard chemically bonded balt, Chester	,
Magnesite Brick	
Standard, Baltimore)
Grain Magnesite St. %-in. grains	
Domestic, f.o.b. Baltimore In bulk fines removed)

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢...\$13.75

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices effective July 26, 1952

		26.	15	95	2								
										(31	ro	ss Tor
Old range,													
Old range,	nonbe	8861	m	er									9.30
Mesabi, be	ssemer								۰	9			9.20
Mesabi, no	nbesse	mer											9.05
High phos	phorus												9.08
After ac	liustme	nts		fo	r	8	ni	al	y	8	in	l.	prices
will be inc													
may be fo													
Dec. 1, 19													
Lake wall													

Lake rail freights, and taxes thereon.

METAL POWDERS

MEIAL FOWDERS
Per pound, f.o.b. shipping point, in ton
lots, for minus 100 mesh.
Swedish sponge iron c.l.f.
New York, ocean bags 10.96
Canadian sponge iron, del'd.
in East 12.0¢
Domestic sponge iron, 98+%
Fe, carload lots 15.5¢ to 17.0¢
Electrolytic iron, annealed,
99.5+% Fe 44.0¢
Electrolytic iron, unannealed,
minus 325 mesh, 99 + % Fe 60.0¢
Hydrogen reduced iron, mi-
nus 300 mesh, 98+% Fe. 63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10
micron, 98%, 99.8+% Fe.83.0¢ to \$1.48
Aluminum 31.5e
Aluminum
Copper, electrolytic 10.75¢ plus metal value
Copper reduced 10.00¢ plus metal value
Cadmium, 100-199 lb 95¢ plus metal value
Chromium, electrolytic, 99%
min., and quantity, del'd \$3.50
Lead 7.5¢ to 12.0¢ plus metal value
Manganese 57.06
Manganese 57.0¢ Molybdenum, 99% \$2.75 Nickel, unannealed 88.0¢ Nickel, approach 88.0¢
Nickel, unannealed 88.0¢
Nickel, annealed 25.0¢
Nickel, spherical, unannealed 92.04
Silicon \$8.54
Nickel, annealed 95.0¢ Nickel, spherical, unannealed 92.0¢ Silicon 38.6¢ Solder powder 7.0¢ to 9.0¢ plus met. value
Stainless steel 302 83 004
Stainless steel 316 \$1.10
Stainless steel, 302 83.00¢ Stainless steel, 316 \$1.10 Tin 14.00¢ plus metal value Tungsten, 99% (65 mesh) \$6.00 Zinc, 10 ton lots 23.0¢ to 30.5¢
Tungsten, 99% (65 mesh) \$6.00
Zinc. 10 ton lots 23.04 to 30.54



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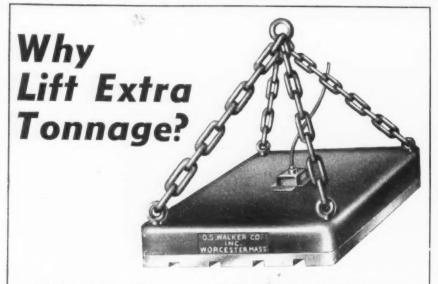
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Walker Lifting Magnet operates with valuable saving of electrical energy . . . high ratio lifting magnet gives maximum lifting with minimum weight. Walker's advanced design insures more payload per lift . . . gets into corners . . . reduces supplementary hand work.

LESS WEIGHT-MORE POWER!

ALKER CO.Inc.

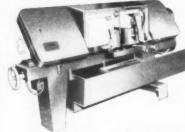
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Why? Because Kalamazoo's hydraulic frame control is coordinated with the feed control to give just the right blade pressure for smoothest, most accurate cutting of tubing and thin wall sections. In addition, the saw frame cannot drop accidentally and damage material or saw blade. Yes . . . here's another reason why Kalamazoo is synonomous



with precision metal sawing at lowest cost . . . another reason why it will pay you to specify Kalamazoo Metal Cutting Band Saws. Three models, all available with coolant system and casters.

Kalamazoo TANK and SILO CO. 1116 HARRISON ST., KALAMAZOO, MICHIGAN

Remember . . there's a Kalamazoo **Metal Cutting Saw** to fit your exact needs



Model 610 cuts 6" round and 6" x 10" flat. Coolant equipment





Heavy-duty Model 1220 cuts 12" plus on rounds and 12" x 20" flat. Available with or without coolant equipment.

Formallay Price

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— Ferroalloy Prices—
Ferrochrome Contract prices, cents per pound, contained Cr, lump size, bulk in carloads delivered. (65-72%, Cr, 2% max. Si.) 0.06%, C. 30.50 0.20%, C. 29.50 0.10%, C. 30.00 0.50%, C. 29.26 0.15%, C. 29.75 1.00%, C. 29.00 2.00%, C. 29.75 1.00%, C. 29.00 2.00%, C. 29.75 1.00%, C. 29.00 2.00%, C. 4-6%, C. 6-9%, Si. 22.60
S. M. Ferrochrome Contract price, cents per pound, chromium contained, lump size, delivered. High carbon type: 60-65% Cr, 4-6% S1, 4-6% Mn, 4-6% C. Carloads . 21.60 Ton lots . 23.75 Less ton lots . 25.28 Low carbon type: 62-66% Cr, 4-6% S1, 4-6% Mn, 1.25% Max C. Carloads . 27.75 Ton lots . 30.05 Less ton lots . 31.85
High-Nitrogen Ferrochrome Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.
Chromium Metal Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe. \$1.40 0.50% max. C \$1.14 0.50% max. C 1.16 9 to 11% C 1.08
Low Carbon Ferrochrome Silicon (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 21.75¢ per lb of contained Cr plus 12.40¢ per lb of contained Si. Bulk 1-in. x down, 21.90¢ per lb contained Cr plus 12.60¢ per lb contained Si.
tained Cr plus 12.60¢ per lb contained Si. Calcium-Silicon
Contract price per lb of alloy, dump delivered. 30-33% Ca, 60-65% Si, 3.00% max. Fe. Carloads 19.00 Ton lots 22.10 Less ton lots 33.68
Calcium-Manganese—Silicon Contract prices, cents per lb of alloy lump, delivered. 16-20% Ca, 14-18% Mn, 53-59% Si. Carloads 20.00 Ton lots 33.30 Less ton lots 23.30 CMSZ Contract price, cents per lb of alloy,
delivered

	0% C		14	-1	8	%	,	M	In	ì,	5	3	-8	9	19	6	-	31		
Carlo																				
Ton	lots																			33.30
Less	ton	lot	ts					0		0	4				٠			0		23.30
CMS	ntra		pı	ic	e,		c	81	nt	.8		P	01		1	b		0	t	alloy,
	loy 4	1:	45	-4	9	%		C	r,	4	4 5	-6	9	60	1	M	n	ı,	1	8-21%
Al	loy	5:	50).5	6	%		(r			4-	6	%	,	1	M	n		13.50-

SMZ Contract price, cents per pound of alloy,	Less ton lots 22,00	16.00% S	1, 0.70	•	to)	1.3	10	%	d	GF,	3.	ø	υ	-	0.1	10% C.
Contract price, cents per pound of alloy.	Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr,	Ton lots Less ton	lots				• •							0 0			22.00
		Contra															

C	ound	per	1	DC	u	'n	d	•	of		a	11	0	y		f.	0	b		20	su:	90	10	n
St.		8.	v	N		-	3	8	1	r	9	g	h	t	1	a.l	10	17	7-	1	99	6	B	X H
	% M																					16	5.1	51
Ton	ton	0.0			٠.	-																		

Graphidox No. 4	
Cents per pound of alloy, f.o.b.	Sus-
pension Bridge, N. Y., freight all	owed.
max. St. Louis. Si 48 to 52%, Ti 9 to	11%.
Ca 5 to 7%.	
Carload packed	18.00
Ton lots to carload packed	19.00
Less ton lots	20.50

Ferromanganese	
78-82% Mn, maximum contract	base
price, gross ton, lump size.	
F.o.b. Niagara Falls, Alloy, W. Va.,	
Ashtabula, O	\$225
F.o.b. Johnstown, Pa	\$227
F.o.b. Sheridan, Pa.	
F.o.b. Etna, Clairton, Pa	\$228
Add \$2.80 for each 1% above 82%	Mn
subtract \$2.80 for each 1% below	790
Mn.	10%
Briquets-Cents per pound of bri	quet,
delivered, 66% contained Mn.	
Carload, bulk	12.45
Ton lots, packed	14.05

Ferroalloy Prices-

Spiegeleisen

con-

19.50 29.26 29.00

22.00 22.60

chro-

4-6% 21.60 23.75 25.25

% SI,

27.76 30.05 31.85

% N. fer-

each

con-97%

\$1.14

concon-

lump

Fe. 19.00 22.10 23.60

alloy

20.00 **32.30** 23.30

lloy. -21%

% C. 30.75 22.00

lloy.

17.50 19.50

Suswed,

8.00 9.00 0.50

base

uet.

152

Contract prices gross ton; lump, f.o.b.

16-19 % Mn
3 % max. Si
almerton, Pa.
38.00
85.00
85.00 Palmerton, Pa. Pgh. or Chicago

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.
96% min. Mn, 0.2% max. C, 1% max.
Sl, 2.5% max. Fe.
Carload, packed 36.95
Ton lots 38.45

Electrolytic Manganese

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

Carloads Ton Less 0.07% max. C, 0.06% 28.45 30.30 31.50 0.07% max. C 27.95 29.80 31.00 0.15% max. C 27.45 29.30 30.50 0.30% max. C 26.95 28.80 30.00 0.50% max. C 26.95 28.30 29.50 0.75% max. C, 80-85% Mn, 5.0-7.0% S1 23.45 25.30 26.50

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn 21.35¢

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max C, deduct 0.2¢.
Carload bulk 11.40
Ton lots 13.05
Briquet, contract basis carlots, bulk delivered, per lb of briquet 12.65
Ton lots, packed 14.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$95.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$93.00. Add \$1.055 per ton for each additional 0.50% Si up to and including 17%. Add \$1.00 for each 0.50% Mn over 1%.

Silicon Metal

Silicon Briquets

Electric Ferrosilicon

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

Cast Turnings Distilled Cast Turnings 2.95 \$2.95 \$3.75

Less ton lots 2.40 3.30 4.55

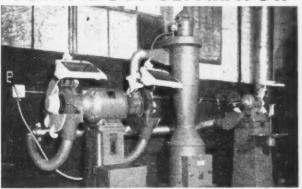
Ferrovanadium

35-55% contract basis, delivered, per pound, contained V.
Openhearth \$3.00-\$3.10
Crucible \$3.10-3.20
High speed steel (Primos) . 3.20- 3.25

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TORIT DUST SEPARATOR



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just the large pedestal grinder.
Torit Dust Separators have ample capacity. Compactly designed they easily fit into present, or future, production layouts. A minimum of piping reduces operational losses and does not block off light or heating sources. Maintenance and power consumption are exceptionally low for machines and separator start and stop together.

stop togetner.

Take your dust problems to Torit. A standard Torit unit probably holds the answer. If not, a special adaptation to fit your requirements can be quickly fabricated. Just drop us a line—there is no obligation.

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Ferroalloy Prices

Alester 200 Al 400 St 400 Fe	
Alaifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspen- sion Bridge, N. Y.	
Ton lots	$9.90 \\ 11.30$
Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per	21.10
pound contained Mo Ferrocolumbium, 50-60% 2 in. x D, contract basis, delivered	\$1.15
per pound contained Cb.	\$4.90
Ton lots	4.95
Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta	\$3.75
Langeloth, Pa., per pound con- tained Mo	\$1.32
Ferrophosphorus, electrolytic, 23- 26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 unitage, per	\$65.00
10 tons to less carload	\$75.00
Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	
lots, per ib contained Ti	\$1.35
lots, per lb contained Ti	
per lb contained Ti	\$1.50 1.55
Ferrotitanium, 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, car-	
Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W5, ton lots, delivered	5177.00
pound contained W5, ton lots, delivered	\$5.00
Molybdic oxide, briquets or cans.	*****
per lb contained Mo, f.o.b. Langeloth, Pa. bags, f.o.b. Washington, Pa., Langeloth, Pa.	\$1.14
Langeloth, Pa. Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b, Philo, Ohio, freight allowed, per	\$1.13
	14.50€
Carload, bulk lump Ton lots, bulk lump Less ton lots, lump	15.75¢ 16.25¢
Vanadium Pentoxide, 86 - 89% V ₂ O ₅ contract basis, per pound	\$1.28
Zirconium. 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy. Ton lots	*****
lowed, per pound of alloy. Ton lots	21.00¢
sis, lump, delivered, per lb of alloy.	7.00#
Boron Agents	1.000
Borosil, contract prices per lb of	
alloy del. f.o.b. Philo, Ohio, freight allowed, B. 3-4%. Si,	\$5.26
Bortam, f.o.b. Niagara Falls	45€
Borosii, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B. 3-4%. Sl. 40-45%, per lb contained B Bortam, f.o.b. Niagara Falls Ton lots, per pound Less ton lots, per pound Corhortam, Tl, 15-21%, B. 1-2%, Sl. 2-4%, Al, 1-2% C, 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.	50¢
f.o.b. Suspension Bridge, N. Y., freight allowed.	
Ferroboron, 17.50% min. B, 1.50%	10.00€
f.o.b. Suspension Bridge, N. Y., freight allowed. Ton lots, per pound. Ferroboron. 17.50% min. B. 1.50% max. Sl, 0.50% max. Al, 0.50% max. C. 1 in. x D. Ton lots F.o.b. Wash., Pa.; 100 lb up. 10 to 14% B. 14 to 19% B. 19% min. B. Grainni, f.o.b. Bridgeville, Pa., freight allowed. 100 lb and over.	\$1.20
14 to 19% B	1.20 1.50
freight allowed, 100 lb and over.	\$1.00
No. 1 No. 6 No. 79	58¢
Manganese - Horon, 75.00% Ma. 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x	
Ton lots	\$1.46 1.57
nax. S., 3.00% max. C, 2 m. 2 D, del'd Ton lots Less ton lots Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Sl, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered	
Sileaz, contract basis, delivered. Ton lots	



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The unusual uniformity of gauge in Micro-Rold allows for closer die setting, assuring the fabricator of uninterrupted production in stamping, forming and blanking operations.

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7.00

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.20

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for faster, easier, sounder welds on non-ferrous and "hard-to-weld" metals

No other welder has this Instantaneous Control feature. Foot-operated, the control provides the heat you call for instantly, *electrically* — not mechanically. No time lag. It's a P&H exclusive that boosts production, cuts costs, saves time.

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Instantaneous control lets you handle "hard-to-weld" metals with ease — aluminum, magnesium, brass, copper, stainless, high carbon, high alloy, and low carbon steels. You get sound welds — X-ray quality every time. No burn-throughs, fewer rejections.

Operators like it, too. It gives them faster, better welds in only five simple steps. Check them:

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- 3 Foot switch control provides exact heat needed while welding no time lag.
- 4 Foot-operated control cuts power either gradually or instantly at completion of weld. Eliminates craters — no scrap pieces needed to run out bead.
- 5 Gas and water shut off automatically according to pre-set time delay.

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- P&H Dial-lectric Control No moving coils or cores to bind or freeze. Maintenance is absolutely negligible.
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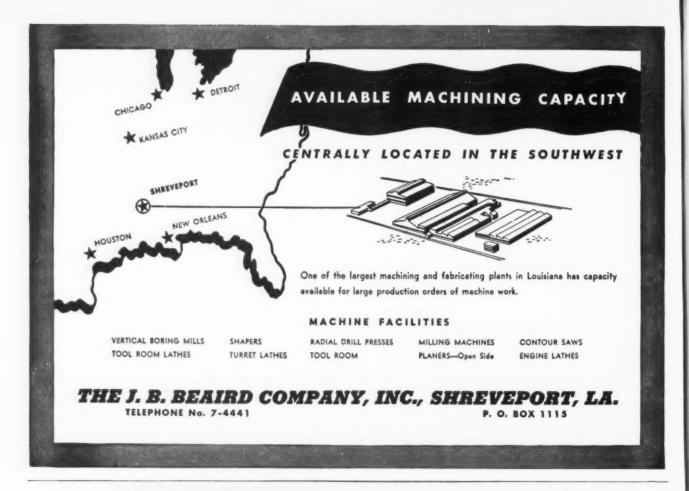
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November 13, 1952

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FREDERICK C. CRAWFORD President, Thompson Products, Inc.

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Grade of HY-TEN-SL	1AA	1A	8	2	3	4
TENSION Ultimate tensile strength lbs.			()	(inimuma)		
per sq. in. Sand Cast	125,000	115,000 120,000 115,000	108,000 110,000 108,000	100,000 105,000 100,000	90,000 95,000 90,000	85,000 85,000 85,000
Sand Cast	95,000	75,000 75,000 75,000	60,000 65,000 65,000	55,000 60,000 60,000	45,000 50,000 50,000	40,000 45,000 45,000
Sand Cast	10	12 12	14 13	15	20 15	25 20
Sand Cast		12 12	14 13	35	20 15	25 20
COMPRESSION Yield Point— lbs. per sq. in Permanent Set at	70,000	65,000	\$8,000	50,900	40,000	35,000
100,000 lbs. per sq. in. (max.) Brinell hardness, No	.015 250	.020 240	.030	.050	.080 175	. 125 150

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the Iron Age

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NEW YORK 17, N. Y.

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PRECISION VERNIER CALIPERS Accurate Dependable



All also

A tool to comply with the most exacting demands. Made by the leading European precision tool craftsmen. Measures inside, outside, thread and depth.

The following models have the famous M-Z-8 cam lock which guarantees fixed and never shifting setting when pressure on lock is released.

READING, PENNA.

#30-61 Chrome Steel	.001" & 1/128"	\$14.00
#30-64 Chrome Steel	.001" & 1/20 mm	-\$14.00
#30-62 Stainless Steel	.001" & 1/128"	\$16.50
#30-65 Stainless Steel	.001" & 1/20 mm	\$16.50

With set screw
#30-78 Chrome Steel .001" & 1/20 mm \$9.75
Total length of above models 8". Scale 6"

12" Calipers and Height Gauges also available Leather cases supplied free of charge with each caliper





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M-Z-B Micrometers I" size to read .0001" with hardened threads, stop-nut and ratchet comparable to the best only \$15.00. Made by the men who made precision tools famous with the "know-how" and experience that produced hundreds of thousands of the finest calipers and micrometers ever sold.

Send for our latest literature giving detailed information on these precision tools,

We also import fine precision pliers-send for information

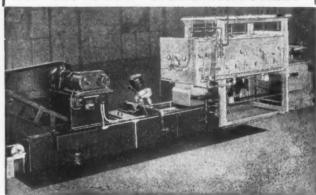
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GRIFFIN Manufacturing Company ERIE, PENNSYLVANIA

GE

HEAT TREATING



WITH THIS AGF MODEL NO. 166 RECIPROCATING FURNACE AND QUENCH TANK, HEAT TREATING AND QUENCHING BECOMES AUTOMATIC.

WORK IS FED INTO THE MUFFLE AT RIGHT OF ILLUS-TRATION. THE RECIPROCATING ACTION CARRIES IT THROUGH IN A STEADY FLOW, THEN INTO QUENCH TANK AND INTO TRUCK OR ONTO CONVEYOR.

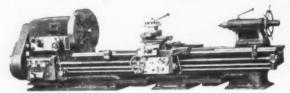
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AMERICAN GAS FURNACE CO. 1004 LAFAYETTE STREET, ELIZABETH 4, N. J.

NEW VDF HEAVY-DUTY LATHES

301/4" and 481/4" swing

Turning lengths, 20' and 22' 11"



Built to USA standards

Immediate Delivery

Two models. Maximum weight of work 6 tons and 10 tons. 36 spindle speeds. 30 H.P. and 50 H.P. A.C. base motors. Scales have inch graduations. Attractive price. Write for complete details.

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CEMENTED CARBIDE Drilled, Tapped, Threaded, Broached within tolerances of .001 of specifications. Hardest manmade metals accerately machined save thousands of \$55 in all types of tool and die work. Die revisions, corrections machined in hardened state with no material change. All work guaranteed. Write

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CHUCKING MACHINES

Four, Five, Six, Eight Spindles . Work and Tool Rotating Type GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

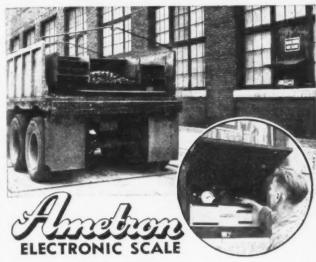
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Sources for every need in the Metalworking industry.

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REDUCE DESIGN, INSTALLATION, MAINTENANCE PROBLEMS . . .

This typical electronic scale installation shows how industry is switching to electronics for heavy weighing. Requires no levers, beam rods, bearings, etc. Sturdy, compact load cells — with huge weight capacities—do the job! The Ametron Recorder (which can be remotely located) automatically prints the exact weight on tape, tickets or ledger cards.

Driver slips load ticket into recorder to print exact weight.

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Branches in Pittsburgh and Allentown, Pa. and Birmingham, Ala.

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HIGH SILICON IRON SILVERY

A Blast Furnace Product made from Only Virgin Ores

THE JACKSON IRON & STEEL CO. - JACKSON, OHIO

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ABRASIVE
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MACHINES
... for bar stock

3-H.P. line—wet and dry cutting, bevel or rt. angle. Capacity: 3/4" solids; 2" tubing; 2" x 6" lt. sheet formed sections; 1/2" x 1" flats.

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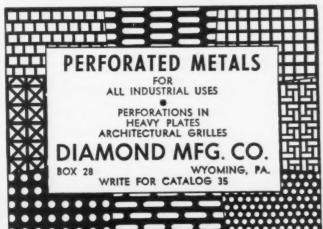
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Stover can make it!



STOVER STEEL VANK & MFG. CO.





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BELT GRINDING UNIT

till Clutch & Machine & Fdry. Co. Open Side Abrasive Belt Grinding Unit, Designed to accommodate slabs up to 1/6" thick x 30" wide x 30" long.

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' x ¾'' Dreis & Krump Leaf Type Bending Brake, Motor Driven with 40 H.P. A.C. Motor.

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6000 lb. Brosius Floor Type Gasoline Driven Charging Machine. Equipped with Peel, Gas-oline Engine, Rubber Tires.

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ton Whiting Two Leg Gantry Crane 52 Ft. Span Cab Control. Three Motors 220 v. 3 ph.

CRANE-LADLE

75 ton Morgan Ladle Crane 49'6" Span 4-Gir-der, With 25 Ton Auxiliary, Complete with 230 Yolt D.C. Motors.

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" McCabe Pneumatic Flanging Machine, Pneumatic Holddowns, Circle Flanging At-tachment.

FORGING MACHINE

' Ajax Forging Machine or Upse driven. Equipped with Air Clutch Upsetter, Motor

FURNACES-MELTING

URNACES—MELTING
10 Ib. Moore Type "UT" Melting Furnace Top
Charge. Complete with Transformer. New
1943—Little Used.
5 ton Heroult Model V-12 Electric Melting
Furnace Top Charge hydroulically operated.
Complete with Transformer Equipment.
5 ton Moore Size "NT" Melting Furnace, with
7500 KVA Transformer 13,200 vo. 3 ph. 60 cy.

HAMMER-COUNTER BLOW TYPE

35 ton Counter Blow Drop Forge Hammer Steam or Air Operated.

LEVELER-ROLLER

60" Aetna-Standard Roller Leveler, Motor Driven. 17 Rolls 4%" dia.

PLATING MACHINE

Type "B" Crown Full Automatic, Nickel & Chrome Plating Machine, Max. Work Size 16" wide x 36" deep x 4" thick.

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Model BL-350 Milwaukee Hydraulic Briquetting Press, Complete with Pumps. Capacity Grey Iron Briquettes 3½ tons per hr.

PRESS-KNUCKLE JOINT

1000 ton Bliss #27 Knuckle Joint, Embossing & Colning Press, 21/2" stroke, 18" Shut Height.

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1500 ton Hydraulic Bending & Trimming Press,
Distance between columns 86" x 86".
2500 ton Hydraulic Bending & Trimming Press,
Distance between columns 90" x 108".

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ROLLING MILLS
8" x 10" Schmitz Single Stand Two High With Friction Drive Rewinder.

121/2" x 16" Philadelphia Two High Cold Rolling Mill. Complete with Pinion Stand, 75 H.P. Motor 440/3/60. Starter and Controls, Incl. Coiler.

18" x 24" Waterbury Farrel Two Stand Two High Rolling Mill. Complete with Elec. Equip.

18" x 50" Three High Roughing Mill, Complete with billet heating furnace and accessory equipment including electrical equipment.

27" x 56" United Two High Skin Pass Mill.

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No. 3 Medart 3-Roll Straightening Machine Capacity I" to 3/3" Bars or 4/2" O. D. Pipe or Tubing. NEW 1950.
No. 18 Sutton Round Straightener, Motor Drive, Capacity 3/16" to 34" O.D. Friction Drive complete with 1/3 H.P. A.C. Motor.

TESTING MACHINE

20,000 lb. Southwark-Emery Universal Hydraulic Testing Machine. 300,000 lb. SOUTHWARK-EMERY Universal Hy-draulic Testing Machine.

UNIVERSAL IRONWORKER

No. 28U-30 Buffalo Armor Plate Universal Iron-worker — Combination Punch, Shear & Bar Cutter. Motor Driven Capacities — Shear 3" Round, 23½" Square, 5x1½" Flat, 5x5x½" Angles 12"—31½# Beams, etc., Punch 1½" thru 1½"

RITTERBUSH & COMPANY, INC.

50 Church Street, New York 8, N. Y.

Phone-Cert 7-3437

The Clearing House

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Election Impetus-Gen. Eisenhower's sweeping victory should at least temporarily stimulate the sluggish used machinery markets around the country. The expected increase in business activity will result more from the fact that the indecision of the pre-election months is over than because the Republicans triumphed.

If the business revival follows its usual pattern, the New York market will be the first to benefit. with the wave then spreading out across the country.

Spare Parts-In Chicago, easing of pressure on machine tools builders is reflected in the speedup of spare parts deliveries to used machinery dealers. One firm reported receipt of a spare part only 1 week after the order was placed. Around the middle of the year, shipment delay for this particular item would have amounted to several months.

Dealers are paring inventories, except for sheetworking equipment, which has shown strength for several weeks and seems to be holding well. The same trend is evidenced to a lesser degree in the rebuilding trade.

Customer Switch-Buying pattern in the Chicago area also seems to be changing. The switch seems to be away from the big buyer of specialized machine tools, who was usually gearing for defense work, to the small general purpose machine shop or tool room. As a result the accent is now on light, versatile equipment.

Market for large tools is far from dead, but used machinery dealers are waiting until they have definite orders before stocking heavy equipment. In the Midwest, at least, the dealer is concentrating on the bread and butter market.

This trend is carrying over into the foreign machine tool market as well. While the majority of dealers plan to drop their lines of foreign tools because the gravy has dribbled out of the market, some are second-guessing themselves for not moving in when the going was good.

Price Gaps-Dealers who do intend to keep stocks of imported tools will limit themselves to light, general equipment such as lathes. Equipment that fills a gap in the American price scale will also be carried. As an example, one firm will continue to stock an English radial drill priced around \$6000 because they believe its intermediate price will be appealing to American buyers even if the market should drop.

The trends outlined affect rebuilders in just about the same way. There were few unusual rebuilding jobs on plant floors last week. Like the reconditioners, rebuilders have been watching machine tool manufacturers' backlogs fade away and have been reviewing their pre-Korea markets.

Resistance-A few used equipment dealers report an increase in buyer price resistance. Some even admit they're "stuck" with certain high-priced items. Price resistance on even light equipment, coupled with a decrease in inquiries is making dealers more inventory conscious.

Dealers carrying new equipment lines in addition to used items were still content with the demand for factory-new machine tools. They report the handful of foreign buyers going through the Midwest are just as interested in new or nearly new equipment as domestic buvers.

Industry Leader Dies-Albert F. Ritterbush, 60, president, Ritterbush & Co., Inc., 50 Church St., New York, passed away at his home in Morristown, N. J., Nov. 2. Mr. Ritterbush was long regarded as an outstanding leader in the machinery business. He founded his firm in 1927 and served as president until his death.

The Ritterbush & Co. business will be carried on by Mr. Ritterbush's associates.

CONSIDER GOOD EQUIPMENT USED FIRST

AIR COMPRESSORS

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AIR COMPRESSORS

14" 112" Pennylvania Air Compressor, 1002" Presaure, Complete with 75 H P. Syn. Motor

18" & 11" 114" Sullivan WJ-3 Air Compressor 885
CFM, Driven by 150 H.P. Westinghouse Syn. Motor 440/3/60

8AR TURNING MACHINE

Medart HF-2 Bar Turning Machine, Capacity 1" to
24", Complete with Accessories

BENDING ROLLS

6' x %" Ryserson Pyramid Type Bending Roll
14" x %" Cleveland Pyramid Type Bending Roll
20" x 1" Southwark Pyramid Type Hending Roll
30" x 1" Southwark Pyramid Type Hending Roll
8" x %" Drels & Krump Leaf Type Bending Brake
Motor Driven with 5 H.P. A.C. Motor
18" x 3/16" Chicago 2226 Steel Apron Brake, M.D

16" x %" Drels & Krump Leaf Type Bending Brake,
Motor Dr. with 40 H.P. A.C. Motor

BRAKES—PRESS TYPE

14' All Steel Hydraulie Press Brake 500 Ton Capacity,
1/4"
115 Zelfer Dreis & Krump Press Brake, Complete

10'x 3/16" Dreis & Krump Press Brake, Complete with Electrical Equipment

CHARGING MACHINE
6000 ib. Brosius Floor Type Gasoline Oriven Charging
Machine, Equipped with Pesi, Buck Gasoline En-

CRANES-GANTRY

CRANES—GANTRY

5 ton Whiting Two Leg Gantry Crane 52' Span Cab
Control Motors 220 v, 3 ph, 60 cy.

15 ton P&H Two Leg Gantry Crane 45' Span With
13' Overhand one end 10' other end 5 ton Auxiliary,
Two Trolleys and 5 Motors 440 volt 3 phase 60 cycle
CRANE—LADLE
75 ton Morgan Ladle Crane 40'6" Span 4-Girder
Construction, with 25 Ton Auxiliary, Complete with
Motors for 230 Volt D.C.
CRANES—OVERHEAD ELECTRIC TRAYELING
5 ton Robblins Myers
28'48" Span 290'8'480 pp. 290'8'48

CRANES-

ANCS OVERHEAD ELECTRIC | Span 230/3/80 |
5 ton Robbins Myers | 28'8" Span 230 Volt D.C. |
10 ton Shaw | 67' Span 230 Volt D.C. |
10 ton P & H | 77' Span 230 Volt D.C. |
10 ton P & H | 40' Span 440/3/80 AC |
10 ton P & H | 60' Span 440/3/80 AC |
15 ton Toledo | 60' Span 230 Volt D.C. |
15 ton Toledo | 46' Span 230'/3/80 AC |
16 ton Bedford | 50' Span 230'/3/80 AC |
17 ton Toledo | 68' Span 230'/3/80 AC |
18 ton Toledo | 68' Span 230'/3/80 AC |
19 ton Morgan | 68' Span 230'/3/80 AC |
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20 ton Morgan
With 5 ton Auxiliary

DIEING MACHINES
To ton Henry & Wright High Speed Dieing Machine
Double Roll Feed, Scrap Cutter, 3" Stroke
100 ton Henry & Wright Dieing Machine, 4" Stroke
13" Shut Height.
DIE CASTING MACHINE
Model BA-12 KUX Die Casting Machine, Air operated. Plunger Gooseneck Type for aine, lead and
tiln. Die nese between bar 12% " 124". Die
Separates 8" NEW 1949, never upsel

Draw Bench, Motor Driven with 50 H.P. Maximum Draw 40 ft.

Motor. Maximum Draw

FLANGING MACHINE

* McCabe Pneumatic Flanging Machine, Pneumatic

tolddowns, Circle Flanging Attachment

b Ajax—Air Cultur FURNACE—ANNEALING Furnace Engr. Co. Bell Type Annealing Furnace Gas Fired. Operating Space 40"x40" Round, 500 CFM Capacity.
FURNACE—HEATING

FURNACE—HEATING

96 KW Leeds & Northrup Homo Furnace #9478-UB28, With controls. Work space 28" dia. x 28" deep

FURNACES—MELING

400 lb. Moore Type "UT" Melting Furnace. Tep
Charge. Complete with Transformer. New 1943—
Little Used
6000 lb. E.I.S. Nose Tilting Furnace. Complete with
Transformer Equipment
15 ton Heroult Model V-12 Top Charge Hydraulically
Operated. Complete with Transformer Equip.

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500 H.P. United Combination Reduction Gear & Pinion
Stand. Gear Ratio 8.581:1
600 H.P. Farrel Birmingham, Size 18 Reduction Gear,
Ratio 720 to 244 RPM
700 H.P. Faik Single Reduction Gear, Ratio 875 to
206 H.P.M. Besta Gear Reduction Unit, Ratio 19:1

INDER
0. 4 Cincinnati Centerless Grinder, Motor Drives
Capacity standard work rest 2" to 6" dia., options
work rest %" to 3". Special fixtures will allow
work to be handled up to 9" dia.
INDER—CYLINDRICAL

GRINDER-14 x 38" Norton Type C. Complete with Elecl. Equip. HAMMERS—BOARD DROP

1200, 1600, 4000 lb, Model J2 Chambersburg
1000 lb, Billings & Spencer

HAMMER—COUNTER BLOW TYPE
25 ton Counter Blow Drop Forge Hammer, Steam or
Air Operated

HAMMER—STEAM DROP
1500, 4000 lb Frie

-STEAM FORGING HAMMERS

AMMERS—3152AM FORGING 1200 lb. Massillon Single Frame 1500, 1600, 2000, 3000, 4000 lb. Chambersburg 600, 1500, 2500 lb. N.B.P. 600, 1500, 2500 assection and the state of the

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HAMMERS-MISCELLANEOUS

AMMERS—MISCELLANEOUS
No. 6N Nazel Hammer, Geared Motor Drive
200 lb. Bradley Compact Hammer, Arr. for Motor
Drive with 10 H.P. A.C. Motor
2000 lb. Chambersburg Pneumatic Hammer Complete
with Elect. Equip. New 1951
15"x12" Chambersburg Gecostamp Hammer, 18" stroke

LATHE-TURRET

iel 2L Gisholt Geared Head Turret Lathe, Spindle ore 4-1/16". Eleci, Equipment and numerous eccesories incl. NEW 1951

LEYFLER-ROLLER
60" Aetna Standard 17-Roll Leveler, 4%", Dia. Rolla
Arr. Motor Drive

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AOTORS
1250 H.P. Westinghouse Induction Motor 6600 volt
3 phase 60 cycle 593 H.P.M.
2000 H.P. General Elec. Induction Motor 6600 volt
3 phase 60 cycle 600 R.P.M.
2500 H.P. General Elec. Direct Current Motor 6600 volt 175,350 R.P.M.

MOTOR GENERATOR SET

0 H.P. General Electric Syn. Motor 4400 volt A.C. with two generators 750 KVA 230 volt D.C., Complete with Panel Board, etc.

NAIL MAKING MACHINES

No. 1½ National—Sizes 10D, 12D, 16D, 20D, 30D No. 3 National—Size 6D No. 2 Glader—Sizes 6D, 7D, 8D, 9D Angell—Sizes 10D, 12D, 16D, roofing

PRESSES-EXTRUSION

Horizontal Extrusion Press, 3-Column Type 26" Diameter, Container suitable for billets 0 ton Horizontal Extrusion Press, 3-Column Type Ram 26" Diameter, Container suitable for billets 5" x 20" 200 ton Horizontal Extrusion Press, 3-Column Type Ram 34" Diameter, Suitable for billets 6" dia. x 22" long

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PRESSES—HYDRAULIC

Model BL-330 Milwaukee Hydraulic Briquetting Press
Complete with Pumps. Capacity Grey Iron Briquettes
3½ tons per hr.
75 ton Williams White Straightening Press 27"
Stroke. Bed 8" x 16", 6½" Dia. Ram
200 ton Bliss Hydrodynamic 48" Stroke Bed Area
24" x 24", Hyd. Pump Incl.
500 ton Southwark Hydraulic 24" Stroke, 78" Daylight Platan 64" R to L x 32" F to B
500 ton Southwark Open Throat Hydraulic Press 12"
Stroke Platen 56" x 56"
700 ton Elmes Forming Press, 27" Stroke, 30" Dia.
Ram, Platen 40" x 38" with overhang 40" x 123",
Complete with Pump and Motor

PRESS-HYDRAULIC WHEEL

0 ton Elmes Inclined Hydr. Wheel Press 72" Be-tween Parallel Bars. Complete with Pump & Motor S—KNUCKLE JOINT
Bliss Knuckle Joint Embossing & Coining Press
100 ton Capacity, 2½" Stroke, 18" Shut Height

1000 too Capacity, 2% Stroke, 18 Shut Height
PRESSES—STRAIGHT SIDE
No. 305 Bliss 9" Stroke 14" Shut Height Equipped
with Marquette Air Cushion
No. 59 Toledo Double Geared Tie Rod Press 255 ton
Friction Clutch 18" Stroke 38% z 35" Bed Ares
No. 3 Ferracute Super Speed Punch Press 30 ton
Capacity, NEW 1946—never used
No. 620 Bliss High Production Press, 1% Stroke
S1-40 Verson 200 ton Press, 20" Stroke Bed Ares
40" x 44"
No. 12 2ch & Hahnemann Patent Percussion Press
150 ton 12" Stroke, 17" x 17" Bed Area
No. 103"-% Hamilton 300 Ton 18" Stroke Bed Ares
48" x 104"

PRESS—TOGGLE DRAWING.

PRESS-TOGGLE DRAWING

410A Bliss 650 Ton Double Crank Strokes 25" 17" Bed Area 60" x 84"

PRESSES-TRIMMING

REISES—IRIMMING
Biliss S.S. Trimming Press with Side Shear, 250 Ton
Capacity, 3" Stroke 52" x 30" Bed Area
No. 3 Eric Flywheel Drive Trimming Press, 3%"
Stroke 13" Between Guides

No. 18 Eric Trimming Press, 100-150 Ton 1500 ton Hydraulic Bending & Trimming Press. Dis-tance between columns 86" x 86" 2500 ton Hydraulic Bending & Trimming Press. Dis-tance between columns 90" x 103"

PUNCH—BEAM
Long & Allstatte
Beam Punch I
beam and small ter Double End Beam Punch, Capacity End—Punch flanges and web 24" I-aller

PUNCH & SHEAR COMBINATIONS

No. 28 U-30 Buffalo Armor Plate Universal Ironworker. Capacity Punch 1½" thru 1½", Shear 8"

Round 3%" Square, 5 x 1½" Flat, 5 x 5%" Angles

Style EF Cleveland Single End Punch & Shear, M.D.

Capacity Punch 1" thru 1½"

ton Hanna Bull Riveter, Air Driven, 24" Gap. 75" each. Capacity 1" rivets cold and 1\%" rivets het

ROLL—PLATE STRAIGHTENING
7 Roll Bertsch Plate Straightening Machine, Capacity
10' x 3," Complete Elect. Equip.

10° x 3c Complete Elect. Equip.

75c Stockel Four High Rolling Mill, Max. Steel
Width 6". Work Rolls 2%" x 75c. Complete with
electrical equipment
8"x10" Schmitz Single Stand Two High
12"x18" Single Stand Two High, Comp. with Elect.

12"x16" Single Stand Iwo Rags, Security Stand Iwo High 12"x24" Waterbury Farrel Two High 15"x30" Mossberg Single Stand Two High 18"x24" Waterbury Farrel Two Stand Two High 20"x30" Two Stand Two High 180113" Single Stand Two High 20"x36" Poole Two Stand Two High 22"x40" Single Stand Two High 22"x40" Single Stand Two High 22"x56" United Two High Skin-pass Mill 28"x50" Single Stand Two High Skin-pass Mill 18"x50" Three High Roughing Mill, Complete with billet heating furnace and accessory equipment inel. elecl. equip.

ROLL—TAPER FORGING

No. 00 Williams White Taper Forging Roll. Rells
24" Dia., Shaft 8" Dia.

No. 3 Nyeraon Frietion Saw, 54" Blads Hydraulie Feed, Complete with Eleci. Equip. 52" Ryerson Friction Saw, 45 H.P. Motor, Capacity Approx. 9" Round, 20" I-beam, 12" H-beam

SHEAR-ALLIGATOR

No. 7 Thomas Carlin Alligator Shear, 16" Blade 30 H.P., D.C. Motor

SHEARS—ANGLE
Hilles & Jones No. 2 Double Angle Shear, M.D.
Capacity 6" x 6" x %"
Long & Alistatte Double Angle Shear, Model B
Capacity 6x6x%". Complete with Elect. Equip.

SHEAR—BAR
No. LH Lewis Open End Bar Shear, Motor Drive.
Canacity 11/6" Round

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No. 60 Quickwork Botary Shear, %" Capacity
No. 100 Kling Rotary Shear, 1" Capacity
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Quickwork Rotary Shear 5/16" Capacity
Complete with Circle Cutting Attachment
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Driven

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12'33/16" Stameo Steel Squaring Shear, Motor Dr.
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	H.F.	MAKE	Type	Asits	54 L. MI
1	2200	G.E.	MCF	600	400/500
1	1750	Whee.		600	550/700
1	1500	Whae.		525	500
1	940	Whse.	QM	350	140/170
1	600	Al. Ch.		250	400/800
1	500	Whse.	CC-216	600	800/900
1 1 1 1 1 1	450	Whan.		550	415
1	400	G.E.	MCF	550	800/1050
1	350	Cr. Wh.	CCM-151H	280	1100
1	835	Whee.	MQ	250	300/900
1	200/300	G.E.	MPC	230	860/920
1110	200	Rel.	1970T	230	720
1	150	G. E.		600	250/750
1	150	Cr. Wh.	65H	230	1150
0	150	Cr. Wh.	88H-TEFC	280	960
3	150	Whae.	8K151B	280	900/1800
1	150	Wase.	8K-201	280	360/950
1	50/120	G.E.	MCF	230	250/1000
1 1 1 1 1 1	100	Whee.	8K-181	230	450/1000
1	100	G.E.	CD-175	230	365/780
1	100	G.E.	CDP-115	230	1750
		MILL	& CRANE		
1	50	G.E.	CO-1810	230	725
1	88	Whae.	K-8	230	505
3	80	G.E.	MD-104% AA	550	700
1	20	Whee.	K-5	230	975
4	15	Whse.	K-5	230	680
	10	C.W.	SCM-AH	230	1150
1	10	G.E.	MD-104	230	400/800
1	6.25	Whee	K-8	280	680
4	8	C.W.	SCM-FF	230	1750
3	8	Whae.	HK-2	230	885
1	3%	Whee.	K-1	230	885

A.C. MOTORS

3 phase—60 cycle

w.	He.	Make	Type	Volts 8	Beed
1	1800	G.E.	MT-498	2300	360
1	1500	ABB		2300	720
î	1200	G.E.	MP CW	2300	375
i	500	Whee.	CW	558	350
î	500	G.E.	IM	440	940
2	500	G.E.	M-574-Y	6600	900
ĩ	500	G.E.	IP	550	505
î	400		CW	440	514
î	350	G.E.	MT-442X		
î	800	A R CTI-		440	505
î	250	G.E.	MT-424-T	4000	257
î	250	G.E.	MT-5598	3200	1800
i	250	Al. Ch.	WIT-0988	550	600
î	200	Cr. Wh.	36QB	449	506
2	200	Cr. wh.	IM17	550	585
	200	G.E.	131-17		606
8		GE.		440	
ž.	200	G.E.	IM	440	485
1	200	G.E.	MTP	440	1170
1		and) Whae.	CW	2300	485
1	125	Al. Ch.	34m × 44m	440	720
*	125	G.E.	MT-566Y	440/2200	485
3 5	108	G.E.	IM	440	600
5	100	A.C.	ANY IM-16	440	695
1	100	G.E.	IM-18	3200	485
1	100	White	CW-868A	440	100
		SQUIR	REL CAGE		
3	650	G.E.	FT-559BY	440	3570
3	450	Whee.	CB-1426	1800/4150	354
1	300	Al. Cb.		2200	385
1	200	G.E.	IK-17	440	880
1	200	G.E.	IK	440	865
8	200	G.R.	KT-557	440	1800
ī	150	Whee.	CB-856B	440	880
1	150	Whan.	CB	440	580
1	150/75	G.E.	C8 8568 C8 IK ARW	440 900	1/450
8	125	Al. Ch.	ARW	2200	1750
1	125	G.E.	KF-6828-E	440/2200	95.85
ĩ	125	Whae	Me	440	485
-	440	SYNC	HRONOUS	***	200
2	3500	G.B.	TH	2300	257
1	2100	G.E.	ATI	2300	260
3	1758	G.E.	ATI	2300	8890
3	2000	G.B.	W.L.I.		
1		Whae.	A FREE	2300	120
	735	G.E.	ATI	3200/12000	660
1	450	Whee.	- mar	2300	450
3	350	G.E.	TH	2200	150
	30	C C-4-	9 DL 4	0 0.	

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Qu.	K.W.	Make	RPM	D.C. Velta	A.G.
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8	1500	G.E.	514	250	6809/13260
1	1500	G.E.	720	509	6600/13200
8 1 1 1	1500	G. M.	360	275	4400
1	1500	Whee.	000	608	4160
3	1000	Whee.	900	600	4160
1	1000	G.E.	990	269	4600
1	1000(8())	G. H.	900	350	3300
1	750	Whse.	900	275	4160
1	500	G.E.	720	125	2300
1	500	Whee.	900	125/250	440
1	580	Whee.	988	250	6600/18200
1	580	Whee.	1200	135/250	2300
1	400	Whae.	1200	358	2390
1	400(SU)	Cr. Wh.	1200	125/250	1800
1	350	G.E.	900	125	2200/4160
1	300	Al. Ch.	1200	125/250	3380
1	150	Whee.	1200	275	2200
1	140 (BUT)	Cr. Wh.	698	125/250	449/2300
1	100	Delco	1200	120/240	2300
1	100	G.E.	1170	125	230/440
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D. E. DONY MACHINERY CO. 47 Laurelton Road Rochester 9, N. Y. Barber-Colman type A Model 12 Gear Hobber, 1943. Cincinnati #2 Centerless Grinder, filmatic, 1943. Reed model A21 Thread Roller, 1944. Warner & Swasey #3 Turret Lathe, bar feed, 1942.

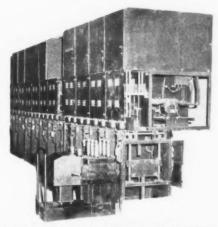
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General Electric type MI-9 drawout type Metal Clad Switchgear, each unit containing one FK-143R, 1200 ampere, 7500 volt, 3 pole, 50,000 KVA oil blast oil circuit breaker, solenoid operated, 125 volt DC, complete with control switch, indicating lamps, current and potential transformers.

The above is one complete switchboard but can be divided to suit your needs.

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(without oil)

Qu.	Make	Type	Volt	Amp.	Control	Int. Cap.
2	G. E.	FHKO-236-2452-BF73	73,000	600	Motor	500,000
1	G. E.	FHKO-136-2046	73,000	400	Solenoid	350,000
2	G. E.	FKO-136-2046-BS	50,000	400	Solenoid	280,000
1	Condit	FO-40-37-C	37,000	400	Solenoid	750,000
1	G. E.	FHKO-236-1640-BS	37,000	400	Solenoid	500,000
1	G. E.	FHKO-136-2046	37,000	400	Solenoid	500,000
1	G. E.	FKO-136-1026-AS	25,000	400	Manual	125,000
3	Condit	OI	23,000	400	Manual	60,000
1	G. E.	FKO-139-24-AS	15,000	600	Solenoid	350,000
1	G. E.	FHKO-136-1328-BS	15,000	6.0.0	Solenoid	250,000
1	G. E.	FKO-139-24-AS	15,000	1200	Solenoid	350,000

POLE LINE SWITCHES

Qu.	Make	Type		Volt	Amp.	Control	Int. Cap.
17	Condit	PK-5	3 pole	4,500	200	Non-Auto.	10,000
10	El. Spec. G. E.	FKO-37	3 pole	7,500	200	Non-Auto.	10,000
1	G. E.	FKO-37	3 pole	15,000 37,000	400	Solenoid Solenoid	40,000

OUTDOOR CURRENT TRANSFORMERS

Qu.	Make	Type	Volt	Ratio
2	G. E.	K-202	25,000	15/30/6
2 2 2	Westg.	OA	34,000	15,/30/5
2	Westg.	OB	45.00	15/30/5
2	Westg.	OB	47,000	40/80/5
6	Westg.	D-22	23,000	50/100/5
3 3	G. E.	K-61	37,000	150/300/5
3	Westg.	OA	34,500	200/400/5
3	A-C	CW	34,500	800/5/5

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GEAR CUTTERS

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No. 50 Cross Gear Chamfering Machine, m.d. Gleason Spiral Bevel Gear Rougher, m.d. 3" Gleason Straight Bevel, m.d. 8" Gleason Straight Bevel, m.d. 11" Gleason Straight Bevel, m.d. Cincinnati Gear Burnisher, m.d.

GEAR TESTERS

Michigan Gear & Hob Checker, No. 47!, late National Broach & Machine Co. Red Ring Gear Speeder, 10" cap. No. I Brown & Sharpe Spur Gear Tester 12" cap. National Broach & Machine Co. 18" National Broach & Machine Co.

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Kwik-Way Model H. Piston Turning & Grinding Machine, m.d., late No. 76 Van Norman Automatic Piston Turning & Grinding Machine, m.d., late

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No. 11 Brown & Sharpe Self-Contained, m.d. 10x35" Cincinnati Hydraulic, m.d. 10x72" Landis, m.d. 10x72" Norton, motorized 12x36" Landis, m.d. 12x76" Landis, m.d. 12x76" Landis Plain Self-Contained, m.d. 14x18" Cincinnati Plain Self-Contained, m.d. 14x52" Norton, motorized No. 20—10x18" Brown & Sharpe, m.d., late 20x120" Landis Plain Self-Contained, m.d.

DISC GRINDERS

No. 2 Gardner, belted, m.d.
No. 151 Besly, m.d.
Hammond Disc Grinder, Model No. 600
Model VIO Hammond Belt Sander, m.d.
No. 4 Gardner Disc Grinder, m.d.
No. 20 Gardner Comb. Disc Grinder and Roll Sander, m.d. 71/2 H.P. U.S. Elec. Tool Co. Disc Grinder, m.d., No. 24—53" Gardner, m.d. No. 24 Gardner Horiz, Grinder, m.d.

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No. 72A3 Heald Sizematic, m.d. No. 72A3 Heald Gagematic, m.c No. 72A5 Heald Sizematic, m.d.

No. 72A5 Heald Plain, m.d. No. 72A5 Heald Plain, long bed type, m.d., latest No. 73 Heald Airplane, m.d., brand new, latest

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750 500 500 (2) 400 300 300 300 (2) 300 200	M.G. SETS & MAKE AI. ChMG West-Rotary G.ERotary West-MG G.EMG G.EMG G.ERotary WastMG G.EMG G.EMG G.EMG G.EMG	RPM D 720 2: 1200 2: 1200 2: 1200 2: 1200 2: 1200 2: 1200 2: 1200 2: 1200 2: 1200 2: 1200 2: 1200 2: 1200 2: 1200 2:	ERS .C. A.C. 50 2300 50 2300 50 2300 50 2300 50 2300 50 2300 50 2300 50 2300 50 2300 50 2300 50 2300 50 2300 50 2300 50 2300	TRAVELING CRANE 25 Ton—5 Ton Aux. 80' span. AC Motors. Cab Oper- ated. 98% NEW	HP 400 300 150 100 100 (2) 100 (2) 70	A.C. MAKE G.E. G.E. West. G.E. West. West. G.E. G.E.	RPM 450 450 450 900 1200 1750 900 600 1750 900	TYPE SI. Rg. Syn. Syn. Sq. Cg. Sq. Cg. Sq. Cg. Sq. Cg. Sq. Cg. Sq. Cg. Sq. Cg.
150	G.EMG G.EMG	1200 23	50 2300 50 2300		40	West. G.E.	900 1200	8q. Cg. 8q. Cg.
200 200 150 150 150 160 35	WestMG RidgMG G.EMG	1200 25 1200 25	50 2360 50 2308 25 220/140				A-G SETS	. Motors

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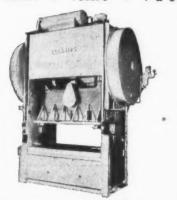
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### ##################################	armature 150/200 150/200 150/140 100/140 100/130 85/65 75/60 75/109 70/90 70/90 50/80	& anti-twhse. Whee. Whee. G. E. G. E. Whee. Whee. Whee. Whee. Whee. Whee. Whee.	MCB-100 MT-5 MCB-90 MDA-109 CO-1831 K-10 K-10 MCA-70 MCA-70 MCA-70	870/300 350 500/415 430/500 675/600 635/700 425/470 500/675 440/400 440/400
11 1 4 8 3 1 1 0 5 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	150/200 150/200 150 100/140 100/140 100/130 85/65 75/60 75/100 70/90 70/90 70/90 50/80	& anti-twhse. Whee. Whee. G. E. G. E. Whee. Whee. Whee. Whee. Whee. Whee. Whee.	MCB-100 MT-5 MCB-90 MDA-108 CO-1831 K-10 K-10 CK-10 MCA-70 MCB-70	370/300 350 500/415 430/500 675/600 635/700 425/470 500/675 440/400 440/400
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14831-58-1181	150 100/140 100/140 100/130 85/65 75/60 75/109 70/90 70/90 50/80	Whse. Whse. G. E. G. E. Whse. Whse. Whse. Whse. Whse.	MT-5 MCB-90 MDA-109 CO-1831 K-10 K-10 CK-10 MCA-70 MCB-70	350 500/415 430/500 675/600 335/700 425/470 500/675 440/400 440/400
14831-591-1931	100/140 100/140 100/130 85/65 75/60 75/109 70/90 50/80	Whse. Whse. G. E. G. E. Whse. Whse. Whse. Whse. Whse.	MCB-90 MDA-109 CO-1831 K-10 K-10 CK-10 MCA-70 MCB-70	500/415 430/500 675/600 335/700 425/470 500/675 440/400 440/400
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5 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	100/130 85/65 75/60 75/100 70/90 70/90 50/80	G. E. Whse. Whse. Whse. Whse.	CO-1831 K-10 K-10 CK-10 MCA-70 MCB-70	675/600 335/700 425/470 500/675 440/400 440/400
5 2 1 1 2 2 1	85/65 75/60 75/109 70/90 70/90 50/80	Whae, Whae, Whae, Whae,	K-10 K-10 CK-10 MCA-70 MCB-70	835/700 425/470 500/675 440/400 440/400
5 9 1 1 1 9 1	75/60 75/109 70/90 70/90 50/80	Whae, Whae, Whae, Whae,	K-10 CK-10 MCA-70 MCB-70	425/470 500/675 440/400 440/400
5 2 1 1 1 2 1	75/100 70/90 70/90 50/80	Whae. Whae.	CK-10 MCA-70 MCB-70	500/675 440/400 440/400
5 2 1 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1	70/90 70/90 50/80	Whee.	MCA-70 MCB-70	440/400 440/400
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1 1 2 1	50/80			
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1 2 1			FW	575/480
2	50	G. E.	CO-1829	750
1	50/65	Whee.	MCLA-121	500/450
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Qu	HP	M	ake	Type	RPM
3	16/19	C.	W.	BW	620/360
1	16/13	G.		MDS-406	615/700
1	15	G.	E.	CO-2505	700
1	15/19	G.	E.	CO-1807	600/525
1.	13/17	G.	E.	MDA -103	645/725
1.	13/17	G.		MDB-103	645/725
All	motors		wound	except those	marked (*)
				mish these for	
tion.			RONO		

3-Phose-40-Cycle

		2.Ludze	-00-61	CIE	
80	HP	Make	P.F.	Volts	RPM
1	6000	G. E.	100	2300	90
1	4350	C-W	100	13.200/6000	514
L	3000	Whse.	80	4800/2400	720
2	2100	G. E.	100	2300	360
2	1750	G. E.	100	2300	3600
	1000	El. Mchy.	100	440	1200
1	750	G. E.	80	2300	450
1	700	G. E.	80	2300	720
1	250	G. E.	100	2300	514
				al, semi or ful	I mag-
etic	, full or	reduced volta	age contri	ol.	

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1	1200	G.E.	MT-26	2200	277
200	1000	Al. Ch.	ANY	2200	235
1	800	G.E.	MT	2200	448
100	600	G.E.	MT-20	2200	300
2	500	G.E.	1-16-M	2300	450
100	400	Al. Ch.	ANY	2200	514
2	400	G.E.	MT-412	2200	450
1	250	Whae.	CW-937	140	1200
			in furnish m		
prima	ary and	secondary	controls up	to 3500-HI	

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Qu	KW	Make	RPM	Volts	Volts AC
1(3-U	2400	Whse.	720	600	2400/4800
3	1000	Whse.	514	600	11000/6600
4	1000	G.E.	514	600	11000/6600
1	1000	G.E.	514	600	2300
1	500	C.W.	720	275	2300/440
1(3-1)	500	Whae.	1200	250	440
2	500	C.W.	720	575	2300/448
2	250	Whse.	1200	125/250	2300
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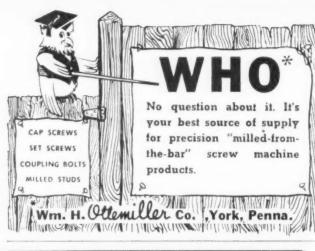
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Bulletin 529 will give you more details. It's yours for the asking.

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The above quotation appears in the introduction of our new 40page reference book which fully describes the ten types of gears in which we specialize. If you are interested in gears built to those standards have your secretary write for a copy of the complete catalog.

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